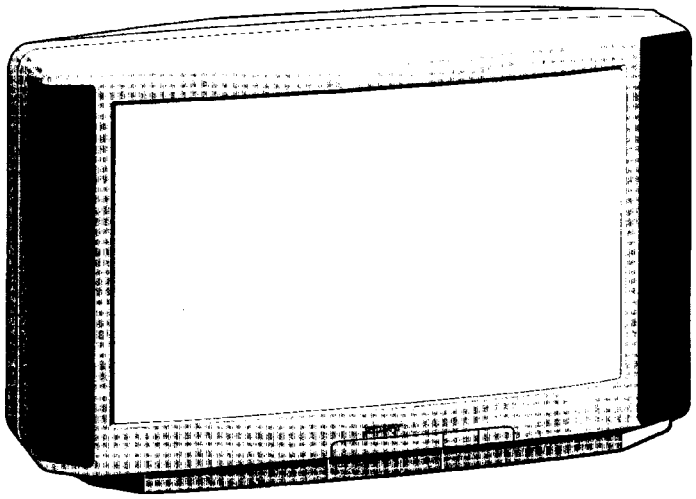
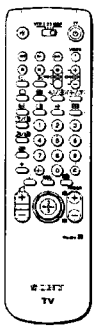
SERVICE MANUAL

AE-4 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-32WX2A	RM-862	Italian	SCC-K43F-A	KV-32WX2E	RM-862	Spanish	SCC-K42F-A
KV-32WX2B	RM-862	French	SCC-K45F-A	KV-32WX2U	RM-862	UK	SCC-K46B-A
KV-32WX2D	RM-862	AEP	SCC-K41F-A				





Super Trinitron

WIDE

TRINITRON® COLOR TV

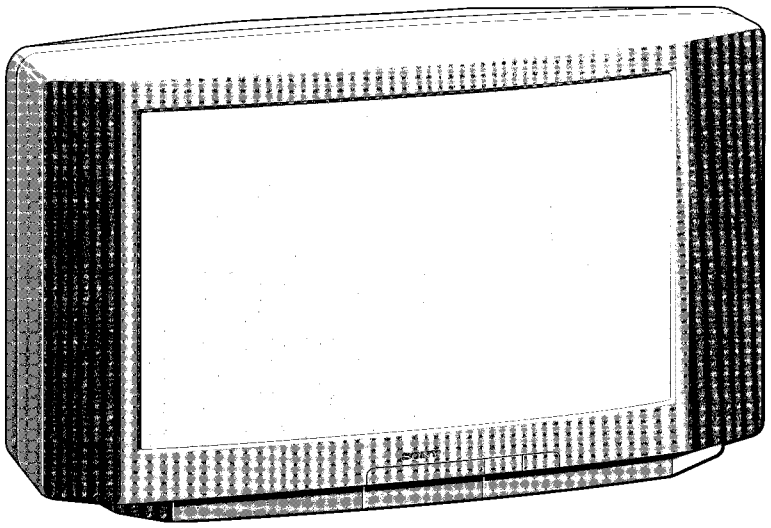
SONY®

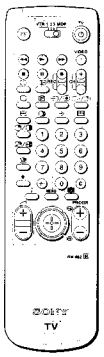
MICROFILM

SERVICE MANUAL

AE-4 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-28WS4A	RM-862	Italian	SCC-K43C-A
KV-28WS4B	RM-862	French	SCC-K45C-A
KV-28WS4D	RM-862	AEP	SCC-K41C-A
KV-28WS4E	RM-862	Spanish	SCC-K42C-A
KV-28WS4K	RM-862	OIRT	SCC-K44E-A
KV-28WS4R	RM-862	OIRT	SCC-K44F-A





Super Trinitron

WIDE

MICROFILM

TRINITRON® COLOR TV

SONY®

ITEM MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)
French	B/G/H, D/K, L, I	L SECAM VHF: F2-F10 UHF: F21-F69 TV CABLE TV (1) VHF: B-Q UHF: S21-S44 PAL B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 PAL I UHF: B21-B69 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, SECAM NTSC3.58/4.43 (video input only)
AEP	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)
Spanish	B/G/H, D/K	PAL B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)
OIRT	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF: A-H, H1, H2 D/K VHF: R01-R12 UHF: R21-R69 CABLE TV VHF: S1-S41, UHF: S01-S05	PAL, PAL+, SECAM NTSC3.58/4.43 (video input only)

MODEL	28WS4A	28WS4B	28WS4D	28WS4E	28WS4K	28WS4R
Power Consumption	122W	131W	135W	135W	135W	135W

SPECIFICATIONS

Picture Tube — Super Trinitron WIDE
Approx. 71 cm (28 inches)
(Approx. 66 cm picture measured diagonally) 110° deflection

Rear/Front Terminals

[REAR]

21-pin Euro connector (CENELEC standard)
- Inputs for audio and video signals
- Inputs for RGB
- Outputs of TV video and audio signals

2/ S 2 21-pin Euro connector
- Inputs for audio and video signals
- Inputs for S video
- Outputs for audio and video signals (selectable)

Audio outputs (variable) - phono jacks
External speaker terminals : 2-pin DIN (5)

[FRONT]

3 Video input - phono jack
3 Audio inputs - phono jacks
3 S video input - 4 pin DIN
Headphones jack: stereo minijack

Sound output	2x30W (music power), 2x15W (RMS) Centre 1x30W (Music), 1x15W (RMS) Surround 2x15W(Music), 2x7.5W (RMS)
Dimensions	798x491x531 mm approx.
Weight	Approx. 47.0 kg
Supplied accessories	Remote Commander RM-862 (1) Batteries R6 (2) Surround speaker (2) Surround Loudspeaker lead (2) Centre speaker lead (1) Aerial cable (1)

Other features
Digital comb filter (High resolution)
FASTEXT, DNR (Digital Noise Reduction)
Dolby Digital Surround System, 100Hz Digital Plus
Graphic Equalizer, PAP (Picture and Picture)
PAL plus, Multi PIP
NICAM stereo (KV-28WS4B and 28WS4U only)

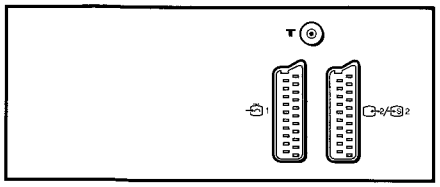
[RM-862]

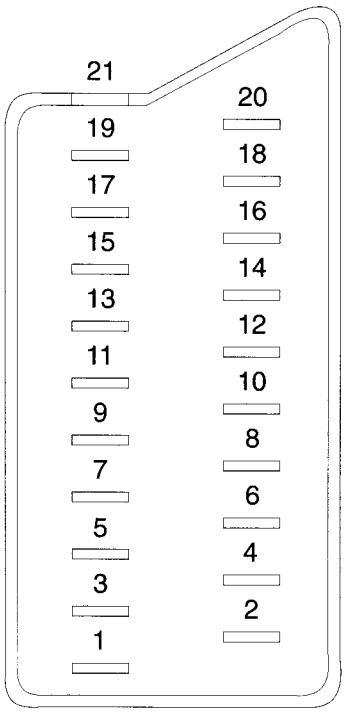
Remote control system	Infrared control
Power requirements	3V dc (2 batteries) R6 (size AA)
Dimensions	Approx. 210x56x24 mm (w/h/d)
Weight	Approx. 110g (Not including battery)

Design and specifications are subject to change without notice.

Item \ Model name	KV-28WS4A	KV-28WS4B	KV-28WS4D	KV-28WS4E	KV-28WS4K	KV-28WS4R
PIP	OFF	OFF	OFF	OFF	OFF	OFF
MPIP	ON	ON	ON	ON	ON	ON
Rotation Coil	ON	ON	ON	ON	ON	ON
VM Set (Velocity Modulation)	ON	ON	ON	ON	ON	ON
PAL +	ON	ON	ON	ON	ON	ON
Scart 1	ON	ON	ON	ON	ON	ON
Scart 2	ON	ON	ON	ON	ON	ON
Front in (3)	ON	ON	ON	ON	ON	ON
AKB in 16:9 mode	ON	ON	ON	ON	ON	ON
TXT	ON	ON	ON	ON	ON	ON
FLOF	ON	ON	ON	ON	ON	ON
TOP	ON	ON	ON	ON	ON	ON
Norm B/G/H	ON	ON	ON	ON	ON	ON
Norm I	OFF	ON	OFF	OFF	OFF	OFF
Norm D/K	ON	ON	ON	ON	ON	ON
Norm L	OFF	ON	OFF	OFF	OFF	OFF
Language Preset	Italian	French	German	Spanish	OIRT	OIRT

21 pin connector (1, 2/S2)





Pin No.	1	2	4	Signal	Signal Level
1	○	○	○	Audio output B (Right)	Standard level : 0.5V rms Output impedance : Less than 1k ohms*
2	○	○	○	Audio input B (Right)	Standard level : 0.5V rms Output impedance : More than 10k ohms*
3	○	○	○	Audio output A (Left)	Standard level : 0.5V rms Output impedance : Less than 1k ohm*
4	○	○	○	Ground (Audio)	
5	○	○	○	Ground (Blue)	
6	○	○	○	Audio input A (Left)	Standard level : 0.5V rms Output impedance : Less than 10k ohm*
7	○	●	●	Blue input	0.7 ± 3dB, 75 ohms, positive
8	○	○	○	Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More10k ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (Green)	
10	○	○	○	Open	
11	○	●	●	Green	
12	○	○	○	Open	
13	○	○	○	Ground (Red)	
14	○	○	○	Ground (Blanking)	
15	○	—	—	Red input	0.7 ± 3dB, 75 ohms, positive
	—	○	○	(S signal) croma input	0.7 ± 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75 ohms
17	○	○	○	Ground (Video output)	
18	○	○	○	Ground (Video input)	
19	○	○	○	Video output	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
20	○	—	—	Video input	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
	—	○	○	Video input Y (S signal)	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
21	○	○	○	Common ground (plug, sheild)	

○ Connected ● Not Connected (Open) * at 20Hz - 20kHz

Pin No.	Signal	Signal Level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB 75 ohm, positive Sync. 0.3V -3 + 10dB
4	C (S signal) input	0.3V ± 3dB 75ohm, positive Sync.

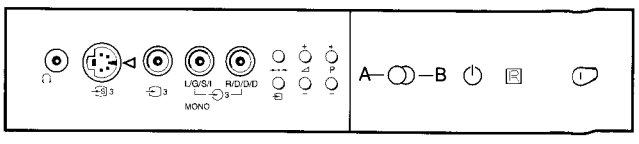


TABLE OF CONTENTS

Section	Title	Page
1. GENERAL		
	Overview	7
	Basic Operation	8
	Advanced Operation	10
	Teletext	14
	Optional Equipment	16
	Additional Information	16
2. DISASSEMBLY		
2-1.	Rear Cover Removal	17
2-2.	Speaker Removal	17
2-3.	Chassis Assy Removal	17
2-4.	Service Position	17
2-5.	G Board Removal	17
2-6.	A Board Removal	18
2-7.	Picture Tube Removal	18
	Removal and Replacement of the Main-Bracket Bottom Plates	19
3. SET-UP ADJUSTMENTS		
3-1.	Beam Landing	20
3-2.	Convergence	21
3-3.	Focus	23
3-4.	Screen (G2), White Balance (Adjustment in the service mode with remote commaner)	23
4. CIRCUIT ADJUSTMENTS		
4-1.	Electrical Adjustments	24
4-2.	Volume Electrical Adjustments	28
4-3.	Test Mode 2:	29
5. DIAGRAMS		
5-1.	Block Diagram (1)	31
	Block Diagram (2)	34
	Block Diagram (3)	37
	Block Diagram (4)	41
	Block Diagram (5)	43
	Block Diagram (6)	45
	Block Diagram (7)	48
5-2.	Circuit Boards Location	50
5-3.	Schematic Diagrams and Printed Wiring Boards	50
	*T Board	53
	*A Board	59
	*Q Board	69
	*B Board	77
	*C Board	85
	*J1 and K Board	88
	*VM Board	91
	*D Board	97
	*G Board	101
5-4.	Semiconductors	105
5-5.	IC Block Diagrams	108
6. EXPLODED VIEWS		
6-1.	Chassis	109
6-2.	Picture Tube	110
7. ELECTRICAL PARTS LIST		111

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

ATTENTION !!

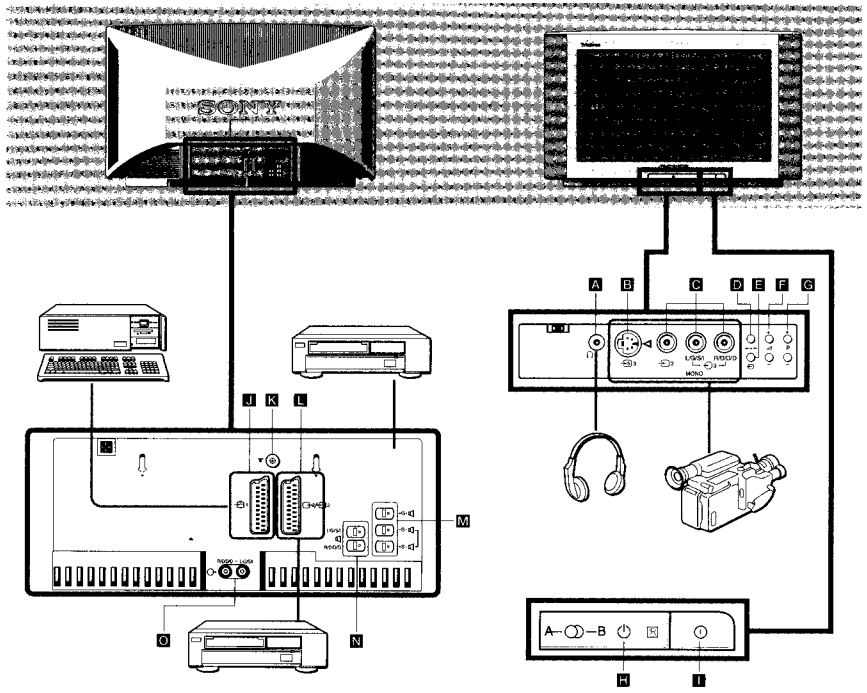
AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÁSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

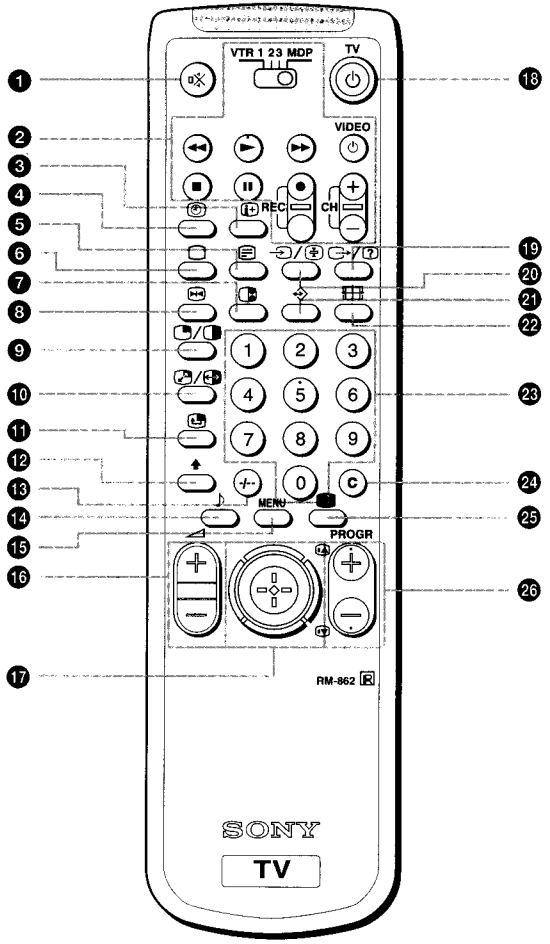
ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE PUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 GENERAL

The operating instructions mentioned here are partial abstracts from the Operating Instructions Manual. The page numbers of the Operating Instruction Manual remain as in the manual.



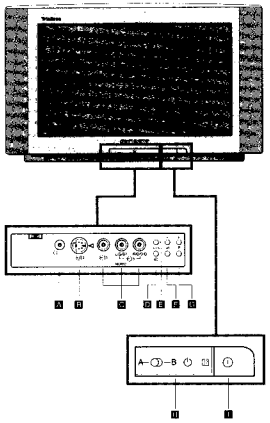


Overview

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. Please open the flaps at the front and at the back of the Instruction Manual for detailed illustrations of the Remote Commander and the TV set. Letters in boxes refer to the buttons and connectors on the TV set, numbers in circles to the buttons on the Remote Commander. For more information, refer to the pages given next to each description.

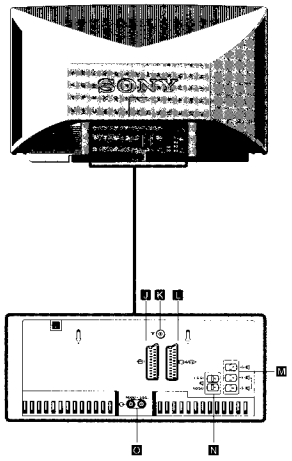
TV set – front

Reference and Symbol	Name	Refer to page
A	Headphones jack	13
B	S video input jack 3	20
C	Input jacks (video, audio) 3, 3	20
D	Reset button	7
E	Input mode button	7
F	+/- Volume control	7
G	P +/- Programme buttons	7
H	Standby mode indicator	7
I	Main power switch	7



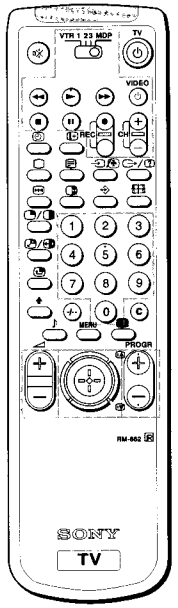
TV set – rear

Reference and Symbol	Name	Refer to page
J	1 21-pin Euro connector	20
K	Aerial socket	5
L	2/ 2 21-pin Euro connector	20
M	C, S, S, External speaker terminals (Centre, Surround)	4
N	L/G/S/I R/D/D/D Left and right speaker terminals	4
O	R/D/D/D L/G/S/F Audio phono jacks	20



Remote Commander

Reference and Symbol	Name	Refer to page
1	Muting on/off button	7
2	**VCR operation**	21
	VTR 123 MDP Video equipment selector	21
	Video equipment operation buttons	21
	VIDEO, CH +/-	
3	On-screen display button	7
4	Time display button	7
5	Teletext button	7, 17
6	TV power on/TV mode button	7
7	PAP freeze button	16
8	Freeze button	7
9	PAP on/off button	16
10	PAP Swap button	16
11	No function on this set	
12	PAP source selector	16
13	- / - - Double digit entering button	7
14	Sound mode button	13
15	MENU Menu on/off button	8
16	+/- Volume control button	7
17	Joystick for Menu selection	8
	Press to confirm selection (OK function)	
18	TV Standby button	7
19	Output mode selector	20
	Teletext: Reveal button	17
20	Input mode selector	7
	Teletext: Freezing the subpage	17
21	Teletext: Favourite pages button	19
22	Screen format button	7
23	1, 2, ... 9, 0 Number buttons	7
24	C Direct channel entering button	7
25	Picture mode button	13
26	PROGR +/- Programme buttons	7
	Teletext: Page up/page down buttons	17



Basic Operation

Step 1 Installation

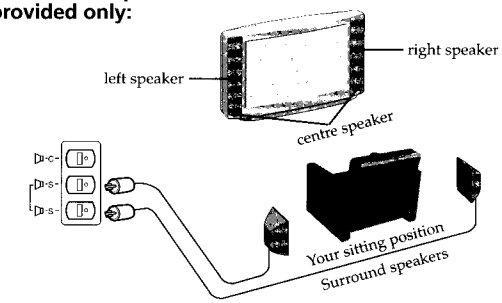
A Connecting the Speakers

! Before first switching the TV on, make sure to connect the speakers to the TV.

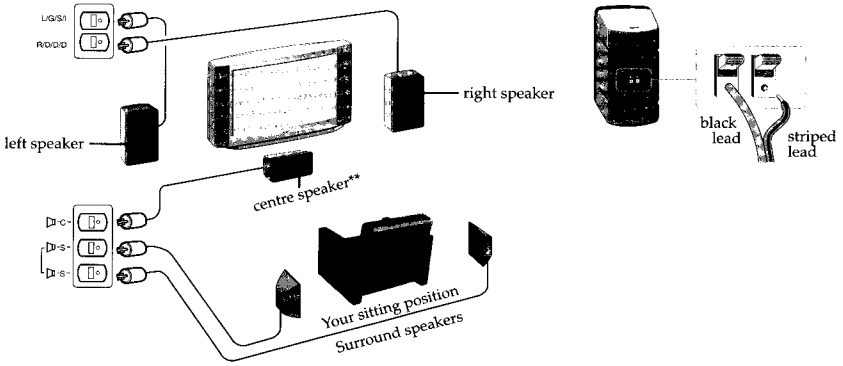
Connect the speakers using the leads provided. The striped lead (+) is for the red terminal of the speaker. The black lead (–) is for the black terminal.
When using your own speakers, make sure they are at least 8 ohms impedance and magnetically shielded.

Dolby* Pro Logic Surround normally requires 5 speakers:
Centre speaker (incorporated in the TV) – for anchoring the stable sound image, like dialogues, to the TV screen.
Left and right front speakers (incorporated in the TV) – for the normal two channel stereo or bilingual broadcasts.
Surround speakers – for the special effects created by the surround channel.

Connect the speakers provided only:



Connect your own speakers:

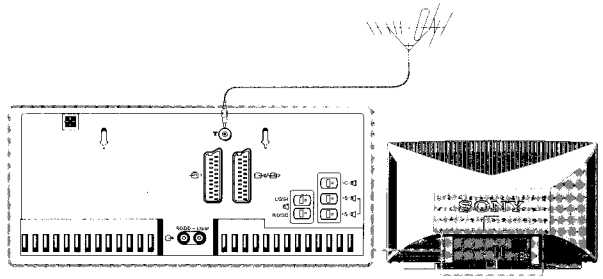


*Manufactured under license from Dolby Laboratories Licensing Corporation. »Dolby«, the double-D symbol and »Pro Logic« are trademarks of Dolby Laboratories Licensing Corporation.

**Use the supplied speaker cable to connect the centre speaker.

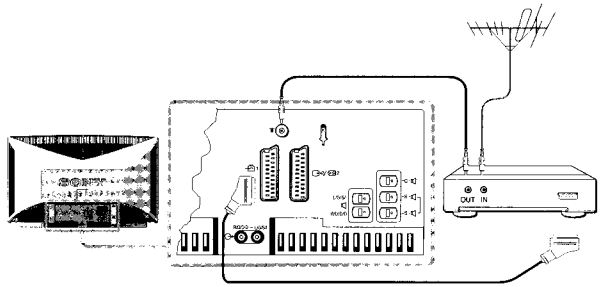
B Connecting the Aerial

(If you connect a VCR, skip to step C)
Insert the aerial plug of the supplied aerial cable tightly into the aerial socket ⅂ K.



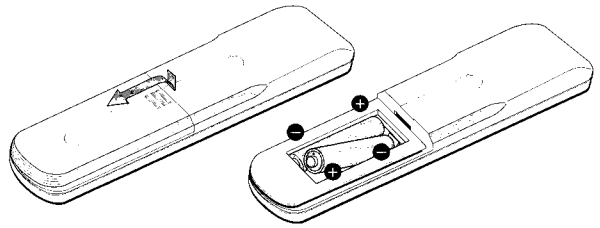
C Connecting a VCR

We recommend that you tune in the VCR signal to the programme position »0«.
Use the preset function »Manual Programme Preset« (page 8) to do this.



D Inserting the batteries into the Remote Commander

Insert the batteries checking the correct polarities.



! Respect your environment! Dispose of used batteries in an evironmental friendly way.

Step 2 Basic Presetting

A Choosing the Menu Language and the Country

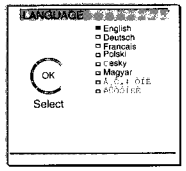
Using this function you select the language of the menu screens. Also you select the country in which you will use the TV. In this way the channels of the selected country will automatically get the top positions during automatic presetting.

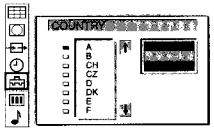
1 Press the power switch ⏻ I on the TV. If the standby indicator ⏻ H on the TV is lit, press ▢ 6 or a number button 29 on the Remote Commander. Press the MENU button 15 on the Remote Commander. The menu LANGUAGE appears.

2 Push the joystick 17 to blue or green to select the language. Press the joystick 17 to confirm your selection. The menu COUNTRY appears.

3 Push the joystick 17 to blue or green to select the country in which you wish to operate the TV. Press the joystick 17 to confirm the selection.

4 Press MENU 15 to restore the normal TV picture.



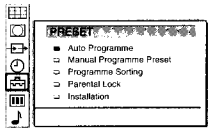


B Presetting Channels Automatically

With this function the TV automatically searches and stores up to 100 channels onto programme positions. If you prefer »Manual Presetting of channels« please refer to page 8 in Advanced Operation.

1 Press MENU 15.

2 Push the joystick 17 to blue or green to select the symbol on the menu screen, then push to yellow.

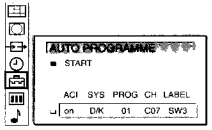


3 Push the joystick 17 to blue or green to select »Auto Programme«, then push to yellow. The menu AUTO PROGRAMME appears.

4 a) All items shown on the menu screen are as wanted: Press joystick 17 to select START. Now the automatic channel presetting starts from programme position 1.

or

4 b) You wish to change items as shown on the menu screen: Push the joystick 17 to blue or green. Push to yellow repeatedly until the desired item is highlighted.



Push the joystick 17 to blue or green to select the following possibilities:

ACI
(Automatic Channel Installation, depending on availability of service in your country)
on: fast channel presetting by special networks using the channel frequency (e.g. F055) TV-system and station label
off: ACI is not active, only ITP (Intelligent Tuner Preset)

SYS (TV Broadcast System)
B/G for Western European Countries
D/K for Eastern European Countries

PROG (Programme Position)
Presetting automatically starts from position 1.

CH (channel)
C to start presetting with terrestrial channels
S to start presetting with cable channels

Press the joystick 17 as soon as the automatic presetting should start.

5 When presetting is finished the normal TV picture appears.

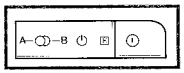
Joystick

Step 3 TV operation

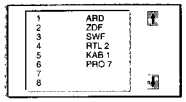
Using Direct Access Buttons

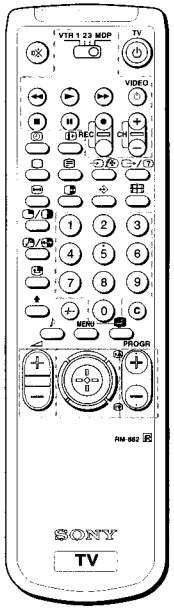
This section explains functions used while watching TV. Most operations are carried out using the Remote Commander (numbers in circles). All basic functions are also available on the TV set itself (letters in boxes).

To	Press
Switch on	• ⏻ I on TV.
Switch off temporarily (Standby mode)	• ⏻ 18. TV is now in standby mode and indicator ⏻ H lights up.
Switch on from standby mode	• ▢ 6, PROGR +/- 25 G or any number button 29.
Switch off completely	• ⏻ I on TV. ! To save energy, we recommend to switch off your TV completely when TV is not in use.
Select programmes	• PROGR +/- 25 G or number buttons 29. For double digit number, press -/- - 13, then the two number buttons 29. E.g. for 24, press 13, then 2 and 4.
Display a programme table	• The joystick 17. Push the joystick 17 to blue or green to select a programme, then press the joystick 17 to confirm.
Display on screen indications	• ⓘ 3. Press again to make the indications disappear.
Adjust the volume	• ◿ + or - 16 F.
Mute the sound	• 🔇 1. Press again to restore the sound.
Display the time (only available when teletext is broadcast)	• ◴ 4. Press again to make the display disappear.
Tune in a channel temporarily	• »C« 24 once for terrestrial channels, twice for cable channels. The indication »C« or »5« for cable channels appears. Enter the channel number with two digits, e.g. for 4, press 0, then 4.
View the input of a connected device (see also page 20)	• ⏎ 20 E repeatedly until the desired input signal appears. Press ▢ 6 to restore the normal TV picture.
View teletext (see also page 17)	• ☰ 5 to switch on. Input a page number, using the number buttons 29 (e.g. for page 125, press 1, 2 and 5). ▢ 6 to switch off.
Change the screen mode (see also page 15)	• ⊞ 22 repeatedly. The mode changes as follows: Auto Wide → Smart → Zoom/PAL Plus → Wide → 4:3
Freeze the picture	• ⏸ 8. Press again to restore the normal TV picture.
Reset picture settings to factory levels	• →•← D.



PROGRAMME TABLE





Advanced Operation

Using the Menu System

Use the following buttons on the Remote Commander to operate the Menu system:

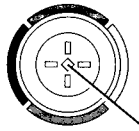
1 Press MENU button ⓯ to switch menu on or off.

MENU

2 Use the joystick ⓱ as follows:

GREEN : scroll up

RED :
decrease/back to last item or to last menu
When menu is not displayed:
Push to red to display the last menu screen



YELLOW :
increase/forward
to next item

BLUE : scroll down

Joystick: Press at its neutral position to confirm selection or store

Advanced Presetting

7a) Direct Input

For channel numbers you need to input a two digit number, for the frequency a three digit number.

- Push to blue or green to select the first digit of the channel number or frequency. Push to yellow to confirm.
- Push to blue or green to select the second digit of the number or frequency. Push to yellow to confirm. In case of the channel number the search starts.
- Push to blue or green to select the third digit of the frequency number. Push to yellow to start the search of the frequency.
- To continue search for another channel: Push to blue or green.
- To store the selected channel: Press the joystick ⓱.
- Repeat steps 4 to 7a) to preset other channels.

7b) Search

- Push repeatedly to yellow until a blue and a green arrow appear in the section SEARCH.
- Push to blue or green to search for the next available channel.
- To continue search for another channel: Push to blue or green.
- To store the selected channel: Press the joystick ⓱.
- Repeat steps 4 to 7b) to preset other channels.

Joystick

Advanced Presetting

Presetting Channels Manually

Using this function you can preset channels one by one to different programme positions. It is also convenient to allocate programme numbers to video input sources.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm the selection.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm the selection.

4 Push to blue or green to select the programme position (PROG) to which you want to preset a channel. Push to yellow to confirm.

5 Push to blue or green to select the TV broadcast system (SYS) (B/G for western European countries, D/K for eastern European countries) or a video input source (EXT). Push to yellow to confirm.

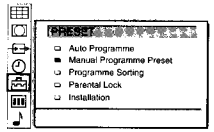
6 Push to blue or green to select »C« (for terrestrial channels), »S« (for cable channels) or »F« (for channel frequency). Push to yellow to confirm.

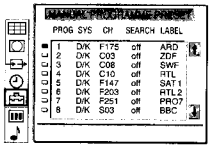
There are two possibilities to preset channels manually:

a) You know the channel number or channel frequency.
Please use method »Direct input«.

or

b) You don't know the channel number or frequency.
Please use method »Search«.





continued >>>>>>>>>>

Captioning a Station Name

Channels are usually automatically labelled during presetting. You can, however, individually name a channel or a video source using up to five characters.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm.

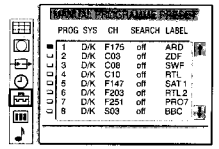
4 Push to blue or green to select the programme position with the channel you want to label. Push to yellow repeatedly until the first element of the position LABEL is highlighted.

5 Push to blue or green to select a letter or a number (select »-« for a blank). Push to yellow to confirm. Select the other four characters in the same way.

6 After selecting all characters, press the joystick ⓱.

7 Repeat steps 4 to 6 to label other channels or video sources.

8 Press MENU ⓯ to restore the normal TV picture.



Skipping Programme Positions

This function enables you to skip unused programme positions when selecting them with the PROGR +/- buttons. However, by using the number buttons you can still select the skipped programme position.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Manual Programme Preset«. Push to yellow to confirm.

4 Push to blue or green to select the programme position you want to skip. Push to yellow to confirm.

5 Push to blue or green to select »---« in the position SYS (system). Press the joystick ⓱ to confirm.

6 Repeat steps 4 and 5 to skip other programme positions.

7 Press MENU ⓯ to restore the normal TV picture.

Sorting Programme Positions

This function enables you to sort the programme positions to a preferable order.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Programme Sorting«. Push to yellow to confirm.

4 Push to blue or green to select the programme position of the channel you want to exchange. Press joystick ⓱ to confirm.

5 Push to blue or green to select the programme position of the second channel. Press joystick ⓱ to confirm. Now the two programme positions are swapped and sorted.

6 Repeat steps 4 and 5 to sort other programme positions.

7 Press MENU ⓯ to restore the normal TV picture.

Using Parental Lock

This function enables you to prevent children watching undesirable broadcasts.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to green or blue to select »Parental Lock«. Push to yellow to confirm.

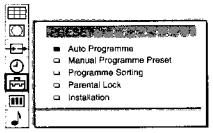
4 Push to green or blue to select the channel you want to block. Press the joystick ⓱ to confirm. The symbol appears before the programme position to indicate that this channel is now blocked.

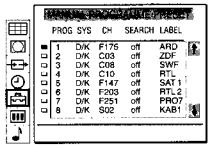
5 Repeat step 4 to block other channels.

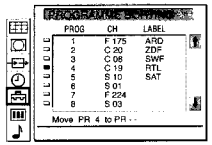
6 Press MENU ⓯ to restore the normal TV picture.

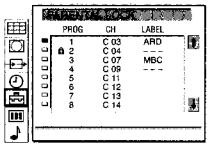
! To unblock: Select the channel to unblock in the menu »Parental Lock«. Press the joystick ⓱. The symbol disappears.

Joystick









Using »Further Programme Preset«

Using the menu »Further Programme Preset« you can

a) in case of a strong local aerial signal (striped picture) attenuate the signal individually for each programme position (RF attenuator).

b) individually adjust and store the volume level of each channel (Volume offset).

c) in case of picture or sound distortions use manual fine tuning to obtain a better picture quality. The factory setting is »on« for AFT (Automatic Fine Tuning).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Installation«. Push to yellow to confirm.

4 Push to blue or green to select »Further Programme Preset«. Push to yellow to confirm.

5 Push to blue or green to select the programme position you want. Push to yellow repeatedly to select:
a) ATT (RF attenuator), b) VOL (Volume Offset) or c) AFT (Automatic Fine Tuning).
The selected item changes colour.

6a) ATT
Push to blue or green to select »ON« for the programme position and press the joystick ⓱ to confirm. Repeat step 6 to attenuate other programme positions.

b) VOL
Push to blue or green to adjust the volume for the selected programme position within a range of -7 to +7. Press the joystick ⓱ to confirm. Repeat step 6 to set the volume level for other programme positions.

c) AFT
Push to blue or green to fine-tune the channel within a range of -15 to +15. Press the joystick ⓱ to confirm. Repeat step 6 to fine-tune other channels.

7 Press MENU ⓯ to restore the normal TV picture.

Using »AV Preset«

Using this function you can preset the desired input source (e.g. 1, RGB signal) to the respective AV input (AV1). In this way a connected VCR switches automatically to the RGB signal. Also you can label the input sources.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Installation«. Push to yellow. Push to blue or green to select »AV Preset«. Push to yellow to confirm.

4 Push to blue or green to select the desired AV input. Push to yellow to confirm.

5 Push to blue or green to select the desired source. Push to yellow to confirm. For the respective AV inputs you have the following choice:
AV1: RGB or AV
AV2: YC2 or AV
AV3: YC3 or AV

6 To label a source: Push to blue or green to select the first character (letter or number, »-« for a blank). Push to yellow to confirm. Select the other four characters in the same way.

7 For automatic format and PAL plus selection (Auto 16:9):
Push to blue or green to select »On« for the AV input.

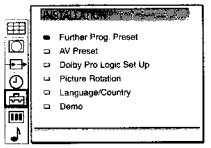
8 Press the joystick ⓱ to store.

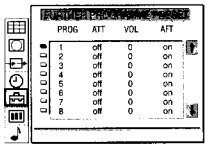
9 Repeat steps 4 to 8 for the other AV inputs.

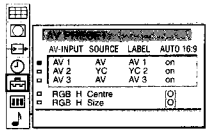
10 For RGB input source only: Push to blue or green to select RGB H Centre.
- Push to yellow to confirm.
- Push to blue or green to adjust the centre of the picture in a range of -5 to +5. Press the joystick ⓱ to store.
- Repeat step 10 to adjust RGB H Size.

11 Press MENU ⓯ to restore the normal TV picture.

Joystick







Setting up Dolby Pro Logic

Before listening to Dolby Pro Logic encoded programmes, you should adapt the Dolby Pro Logic features to your individual requirements. This setting up of the levels and modes of the speakers normally is required only when installing the TV and the speakers or when changing the position of the speakers.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Installation«. Push to yellow to confirm.

4 Push to blue or green to select »Dolby Pro Logic Set up«. Push to yellow to confirm.

5 Push to yellow. The setting »Left« (sound level of the left speaker) changes colour. You hear a test tone from the left speaker.

6 Push to yellow. Push to red or yellow to adjust the level. Press the joystick ⓱ to confirm.

7 Push to blue or green to select Centre (Centre speaker), Right (right speaker) or Surround (Surround speakers). Repeat step 6 to adjust the sound level of a speaker. Repeat steps 6 and 7 to adjust all sound levels (from your sitting position all levels should be the same). Push to red.

8 Push to blue to select »Speaker mode«. Push to yellow to confirm.

9 Push to blue or green to select:
Normal - all speakers are activated
Phantom - centre speaker is not used
Wide - wider bandwidth sound effect
3 Normal - surround speakers are not used
3 Wide - surround speakers are not used, centre speaker carries full frequency response
Press the joystick ⓱ to confirm.

10 Push to blue or green to select »Delay Time«. Push to yellow to confirm. Push to blue or green to select the delay time of the surround speakers (e.g. 20 ms for standard rooms, 30 ms for small rooms).
15 ms ⟶ 20 ms ⟶ 25 ms ⟶ 30 ms
Press the joystick ⓱ to confirm.

11 Push to blue or green to select »Auto Surround«. Push to yellow to confirm. Push to blue or green to select:
On - When receiving a Dolby Surround encoded programme, the TV automatically switches to Dolby Surround sound (depending on availability of service by broadcaster).
Off - normal
Press the joystick ⓱ to confirm.

12 Press the MENU button ⓯ to restore the normal TV picture.

Adjusting the Picture Rotation

If, due to the earth magnetism, the picture slants, you can use this function to readjust the picture.

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol 🧰 on the menu screen. Push to yellow to confirm.

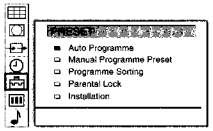
3 Push to blue or green to select »Installation«. Push to yellow to confirm.

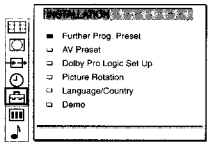
4 Push to blue or green to select »Picture Rotation«. Push to yellow to confirm.

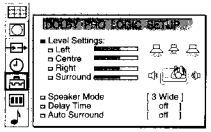
5 Push to yellow. Push to blue or green to adjust the picture rotation. The adjusting range is -4 to +4. Press the joystick ⓱ to confirm.

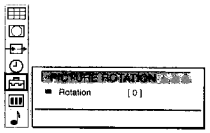
6 Press MENU ⓯ to restore the normal TV picture.

Joystick









Advanced TV operation

Adjusting the Picture and Sound

Joystick

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste.

1 Press ● ㉕ (for Picture) or ♪ ⓮ (for Sound)
or
Press MENU ⓯.
Push joystick ⓱ to blue or green to select ▥ for Picture Control or ♪ for Sound Control. Push to yellow to confirm. The menu PICTURE CONTROL or SOUND CONTROL appears.

2 Push to blue or green to select the desired item. Push to yellow to confirm.

3 Push to red or yellow to adjust the selected item. Press the joystick ⓱ to confirm. For the effect of each control, see the following tables.

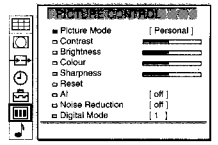
4 Repeat steps 2 and 3 to adjust other items.

5 Press MENU ⓯ to restore the normal TV picture.

Picture Control

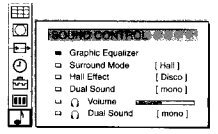
Item	Effect
Picture Mode	• Personal ⟶ Economy (energy saving setting) ⟶ Live ⟶ Sports ⟶ Movie ⟶ Game
Contrast	• Less ——|—— More
Brightness*	• Darker ——|—— Brighter
Colour*	• Less ——|—— More
Hue**	• Greenish ——|—— Reddish
Sharpness*	• Softer ——|—— Sharper
Reset	• Resets picture to the factory preset levels
AI	• Off: Normal On: Automatic optimization of contrast level according to TV signal
Noise Reduction	• Off: Normal On: Reduction of picture noise in case of weak signals
Digital Mode	• 1: Normal 2: LFR (Line Flicker Reduction) off

* Only if »Personal« or »Economy« is selected in »Picture Mode«.
** Available for NTSC colour system only.



Sound Control

Item	Effect
Graphic Equalizer	• See page 14 for details
Surround Mode	• Off: normal ⟶ Pro Logic ⟶ Hall
Hall Effect (only if Hall is on)	• Choice between different hall effects Church ⟶ Hall ⟶ Stadium ⟶ Disco
Dual Sound	• A: channel 1 or B: channel 2 Stereo ⟶ Mono
Headphones	
∩ Volume	• Less ——|—— More
∩ Dual Sound	• A: channel 1 or B: channel 2 ⟶ PAP (if PAP is switched on, you can select the PAP sound for the headphones) ⟶ Stereo ⟶ Mono



Using the Graphic Equalizer

Using this function you can individually adjust the sound by cutting and boosting selected frequencies. Also you can select between the following settings:

Flat → User → Vocal → Jazz → Rock → Pop

1 Press MENU ⓯.

2 Push the joystick ⓱ to blue or green to select the symbol ♪ on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Graphic Equalizer«. Push to yellow to confirm.

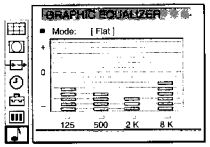
4 Push to yellow. The colour of »Mode« changes. Push to blue or green to select the mode you want.

5 If you want to modify a mode, push repeatedly to yellow until the desired bar of a frequency band changes colour. Push to blue or green to change the level of a bar. In this way you can adjust all 4 graphic bars.

6 Press joystick ⓱ to store the adjustment.

7 Press MENU ⓯ to restore the normal TV picture.

Joystick



Presetting Dolby Pro Logic

To enjoy Dolby Surround encoded programmes, preset the setting »Surround Mode« in the menu »Sound Control« to »Pro Logic«. After the end of the broadcast make sure to return the setting to »Off«.

1 Press button ♪ ⓰ on the Remote Commander.

2 Push joystick ⓱ to blue or green to select »Surround Mode«. Push to yellow to confirm.

3 Push to green or blue to select »Pro Logic«. Press the joystick ⓱ to confirm.

4 Press MENU ⓯ to restore the normal TV picture.

Using the Sleep Timer

This function enables you to select a time period after which the TV automatically switches into standby mode.

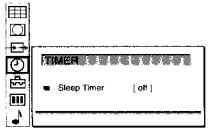
1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol ⏲ on the menu screen. Push to yellow to confirm.

3 Push to yellow. Push to blue or green to select the time.
OFF → 10 min → 20 min .....80 min → 90 min.
Press the joystick ⓱ to confirm.

! One minute before the TV switches into standby mode, a message is displayed on the screen.

4 Press MENU ⓯ to restore the normal TV picture.



Using »Multi PIP«

Using »Multi PIP« you can scan 12 successive TV channels on the screen (Programme Catching) or display 11 successive freeze pictures on the screen (Photo Mode).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol ⊞ on the menu screen. Push to yellow to confirm.

a) Programme Catching

Push to blue or green to select »Programme Catching«. Press the joystick ⓱. Now a scan of 12 successive programmes (11 still pictures, 1 live picture where the cursor is positioned) is displayed on the screen starting from the programme tuned in. Pushing the joystick to blue, green, red or yellow you can move the cursor in all directions and update the still pictures. When selecting a programme position lower or higher than the 12 displayed ones the programme scanning starts again. Press MENU ⓯ to restore the normal TV picture.

Selecting a programme using Programme Catching:

Push the joystick ⓱ to blue, green, red or yellow to select the programme position you want, then press the joystick ⓱. Now the selected programme appears and you are back in the normal TV mode.

b) Photo mode

Push to blue or green to select »Photo mode«. Press the joystick ⓱. Now the main picture is displayed as a succession of 11 still pictures and a 12th picture, which is live. Push to blue or green to start the photo mode again. Press the joystick ⓱ to restore the normal TV picture.

Operating Screen Mode

Using Screen Mode you can change the aspect ration of the screen for wide screen effects, operate PAP (picture and picture) or reproduce the main picture image by image (Strobe function).

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select the symbol ⊡ on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »Screen Mode«. Push to yellow to confirm. Push to blue or green to select one of the following modes:

- Smart - imitation of wide screen effect (16:9) for 4:3 broadcasts.
- Zoom - imitation of wide screen effect (16:9) for movies broadcast in cinemascopic format.
- Wide - for 16:9 broadcasts
- 4:3 - conventional 4:3 picture
- AutoWide - automatic selection of the optimum screen ratio (e.g. 4:3 picture automatically changes to Smart mode, 16:9 picture changes to Zoom mode)

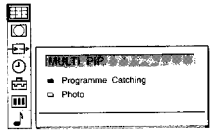
Press the joystick ⓱ to confirm the selection.

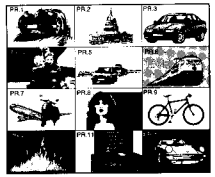
4 Only in Zoom Auto Wide Mode: Changing the Screen position
In Zoom mode parts ot the top and bottom of the picture are cut off. Using »Screen position« you can move the screen up- or downwards in order to see the cut-off parts (e.g. to read subtitles). Push to blue or green to select »Screen position«. Push to yellow to confirm.
Push to blue or green to adjust the screen position (-10 to +10 or -5 to +5).
Press the joystick ⓱ to confirm.

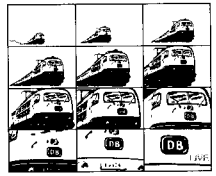
5 Strobe Mode
Push to blue or green to select »Strobe«. Push to yellow to confirm. The TV picture is now displayed image by image, creating a slow motion effect. Push to blue or green to select the speed of the motion. Press the joystick ⓱ to restore the normal TV picture.

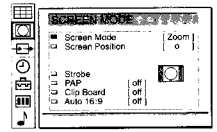
6 PAP (picture and picture)
Push to blue or green to select »PAP«. Push to yellow to confirm. Push to blue or green to select:
1 – PAP screen in 8:9 format, 2 – PAP screen in 4:3 format, Off – PAP switched off
Press joystick ⓱ to confirm.

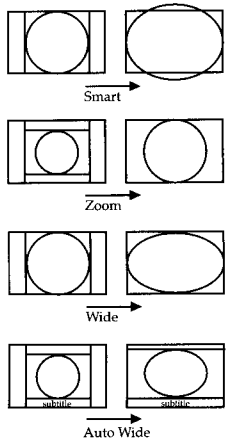
Joystick











continued >>>>>>>>>

7 Clipboard
Push to blue or green to select »Clipboard«. Push to yellow to confirm. Push to blue or green to select »On« to freeze the PAP screen or »Off« for normal picture.
Press joystick ⓱ to confirm.

8 Auto 16:9
Push to blue or green to select »Auto 16:9«. Push to yellow to confirm.
Push to blue or green to select »On« for automatic selection of format or PAL plus in case of PAL plus broadcast or »Off« for normal mode.
Press joystick ⓱ to confirm.

9 Press MENU ⓯ to restore the normal TV picture.

PAP (Picture and Picture)

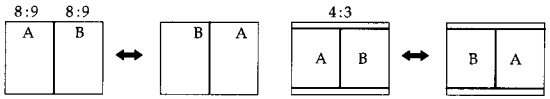
With PAP you can view two programmes simultaneously (e.g. two TV channels or a video source and a TV channel). The left screen is the main screen with the sound from the speakers, the right screen is the sub screen with the sound selectable via headphones.

Switching PAP on and off

Press ⧉/◨ ❾ once to display the screens in format 8:9, twice to display the screens in format 4:3 and three times to switch PAP off.

Selecting a PAP source

Press ⬆ ⓬.
The symbol ⬆ appears in the sub screen. Select the PAP source using PROGR +/– ⓴, the number buttons ㉘ or ⮌ ⓴ (for a video source).

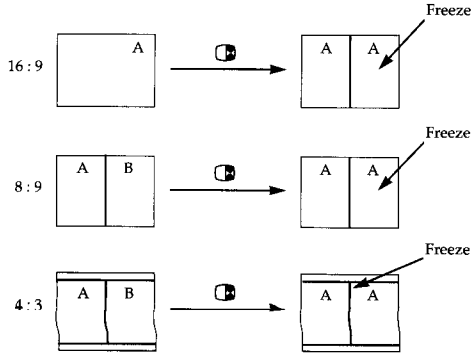


Swapping screens

Press ⧉/◧ ⓾ once to swap the programmes of the main and sub screens.

Freezing the picture of the sub screen

Press ◨ ❼ once to freeze the sub screen, twice to return to the normal live picture.



Teletext

Most TV channels broadcast information via teletext. The index page of the broadcaster (usually page 100) informs you about how to use the service. Make sure to use a TV channel with a strong signal, otherwise Teletext errors may occur.

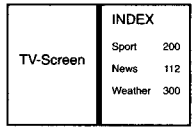
Direct Access Function

Switching Teletext on and off

1 Select the TV channel which carries the teletext service you want to view.

2 Press ☰ ❺ once for P&T (Picture and Teletext). The normal TV screen is displayed on the left, the Teletext screen on the right.
Press ☰ ❺ twice to get Teletext only.
Press ☰ ❺ three times for Mix mode. The normal TV screen and the Teletext screen are overlapped.

3 Press ▢ ❻ to switch Teletext off.



Selecting a Teletext page

Direct Page Selection
Use the number buttons ㉘ to input three digits of the page number.
If you have made a mistake: Type in any three digits, then reenter the correct page number.

Page Catching
1 Select a teletext page with page numbers (e.g. index page).

2 Press the joystick ⓱. »Page Catching« is displayed at the top of the page.
Push joystick ⓱ to blue or green to select the page you want. Press the joystick ⓱.
The requested page is displayed after some seconds.
Press ☰ ❺ to resume normal teletext reception.

Joystick

Accessing the next or preceding page

Press ▲ ㉖ (Page +) or ▼ (Page -).

Freezing a teletext subpage

Press ✱ ⓴. The symbol ✱ is displayed.
Press ☰ ❺ to resume normal teletext reception.

Revealing hidden information (e.g. for a quiz)

Press ⑦ ⓳. Press again to cancel.

Using Fastext

(only available, if the TV station broadcasts Fastext signals)

With Fastext you can access pages with one key stroke. When Fastext is broadcast, a colour-coded menu appears at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue marks on the Remote Commander.
Push the joystick ⓱ to the colour mark which corresponds to the colour-coded menu.
The page is displayed after some seconds.

continued >>>>>>>>>

Using the Teletext Menu

Your TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the buttons for menu operation to operate the teletext menu.
Select the teletext menu functions as follows:

1 Press MENU ⓯. The menu is superimposed on the teletext display.

2 Push the joystick ⓱ to blue or green to select the teletext function you want.
Push to yellow to confirm the selection.

USER PAGES/PRESET USER PAGES
See page 19 for information about presetting and operating the user pages.

INDEX
The index gives you an overview of the contents of the teletext you are using.

TOP/BOTTOM/FULL
For convenient reading of a teletext page you can enlarge the teletext page. After selecting the function, an information line »Top ↑ Bottom ↓ OK Full« is displayed. Push joystick ⓱ to green to enlarge the upper half, push to blue to enlarge the lower half. Press the joystick ⓱ to resume the normal display. Press ☰ ❺ to resume normal teletext reception.

TEXT CLEAR
After selecting the function, you can watch a TV programme while waiting for a requested teletext page to be captured. When the page is available, the symbol ☰ changes colour. Press ☰ ❺ to view the requested page.

SUBTITLES
Check with your teletext service for information about subtitled TV programmes. After selecting the function the subtitles are displayed.

TIME PAGE
Check with your teletext service about the availability of time coded pages.
If available, you can call up a page (e.g. an alarm page) at a certain time.

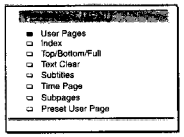
1 Select TIME PAGE in the teletext menu.
Push joystick ⓱ to yellow. An information window is displayed. Push to blue or green to select »On«. Push to yellow.

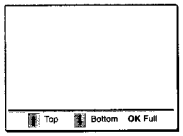
2 Use the number buttons ㉘ to enter the three digits of the page you want (e.g. 301).
Push to yellow after each digit.

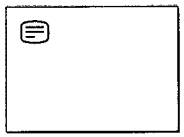
3 Use the number buttons ㉘ to enter the four digits of the desired time (e.g 18-54).
Push to yellow after each digit. Press joystick ⓱ to confirm. Press MENU ⓯. The time is displayed in the top left-hand corner of the screen.
At the requested time the page is displayed.

SUBPAGE
Using this function you can select a particular teletext page from several subpages (e.g. page 2 of 6 pages in total). After selecting the function an information line is displayed. Use the number buttons ㉘ to enter the four digits (e.g. enter 0002 for the second page of a sequence).
To cancel the request: Push joystick ⓱ to red and then to yellow.

Joystick







User Page Bank System

You can store up to 6 of your favourite teletext pages per Teletext service. In this way you have quick access to the pages you frequently use.

Storing pages

1 Press ☰ ❺ to switch Teletext on. Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select »Preset User Pages«.
Push to yellow to confirm.

3 Push to blue or green to select the bank (from A to E) you want.
Push to yellow to confirm.

4 Push to blue or green to select the three digits of your first favourite page.
Push to yellow after each digit. Push to yellow to confirm.

5 Repeat step 4 for the other 5 favourite pages. If you do not want to preset all 6 page numbers push to yellow without inserting any number. After finishing the presetting, press the joystick ⓱.

6 Push to blue or green to select »Allocate Bank«. Push to yellow to confirm.

7 Push to blue or green to select the programme position of the channel which carries the teletext service for which you have selected your favourite pages.
Push to yellow to confirm.

8 Push to blue or green to select the bank from step 3. Press the joystick ⓱ to confirm.

9 Repeat steps 3 to 8 for the other 4 banks available.

Displaying User Pages

1 Press MENU ⓯.

2 Push joystick ⓱ to blue or green to select »User Pages«. Push to yellow to confirm.

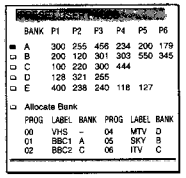
3 Push to blue or green to select the page you want. Press the joystick ⓱.
The page is displayed after some seconds.

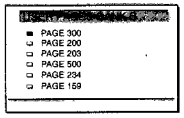
or

1 Press ✣ ㉔.

2 Push joystick ⓱ to blue or green to select the page you want. Press the joystick ⓱.
The page is displayed after some seconds.

Joystick





continued >>>>>>>>

Optional Equipment

Connecting Optional Equipment

You can connect a wide range of optional equipment to your TV. Refer to the illustrations on the back lap page of this Instruction Manual.

Symbol	Acceptable input signals	Available output signals
1	Normal audio/video and RGB	Audio/video from TV tuner
2/2	Normal audio/video and S video	Audio/video from selected source
3, 3	Normal audio/video and S video	No output
	No inputs	Audio from selected source

About S video input
Video signals may be separated into Y (luminance) and C (chrominance) signals. Separating the two signals prevents interference and thus improves the picture quality.

Tips:
- If the picture or sound is distorted, move the VCR away from the TV.
- When connecting a monaural VCR, connect only the white jack to both the TV and VCR.

Selecting Input and Output Signals

a) Direct Access Buttons

Selecting the Input
Press 20 E repeatedly to select one of the following input modes:

Symbol on the screen	Input signals	
1	Audio/video through Euro AV connector	J
	RGB through Euro AV connector	J
2	Audio/video through Euro AV connector	L
2	S video through Euro AV connector	L
3	Audio/video through the phono jacks	C
3	S video through the 4 pin DIN	B

Press 6 to restore the normal TV picture.

Selecting the Output from Euro AV connector 2/2 L
Press 19 repeatedly to select one of the following output sources for the connector 2/2 L:

Symbol on the screen	2/2 L connector output signal	
1	Audio/video from Euro AV connector	J
2	Audio/video from Euro AV connector	L
2	Audio/video from Euro AV connector	L
3	Audio/video from the phono jacks	C
3	Audio/video from the 4 pin DIN	B
TV	Audio/video from the aerial terminal	K

b) Using the Menu »Video Connection«

1 Press MENU 15.

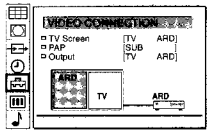
2 Push joystick 17 to blue or green to select the symbol on the menu screen. Push to yellow to confirm.

3 Push to blue or green to select »TV screen« (input source for TV-screen), PAP (source for PAP sub screen), or »Output« (output source for 2/2 L). Push to yellow to confirm.
You can select between the following sources:
• TV: TV-tuner • YC: S video signal • AV: Audio/Video • Sub: 2nd TV-tuner

TV screen: TV, AV1, RGB, AV2, YC2, AV3, YC3
PAP: Sub, AV1, AV2, YC2, AV3, YC3
Output: TV, AV1, AV2, YC2, AV3, YC3

4 Push to blue or green to select the desired source. Press joystick 17 to store.

5 Press MENU 15 to restore the normal TV picture.



Joystick

Remote Control of other Sony Equipment

Using the buttons 2 on the Remote Commander you can control other Sony equipment.

1 Set the selector VTR 1 2 3 MDP according to the equipment you want to control.
VTR 1: Beta VCR
VTR 2: 8mm VCR
VTR3: VHS VCR
MDP: Video Disk Player

2 Use the buttons 2 on the Remote Commander to operate the equipment.

Tips
- If your video equipment has a COMMAND MODE selector, set this selector to the same position as the VTR 1 2 3 MDP selector on the TV Remote Commander.
- If the equipment does not have a certain function, the corresponding button on the Remote Commander does not work.

Additional Information

Troubleshooting

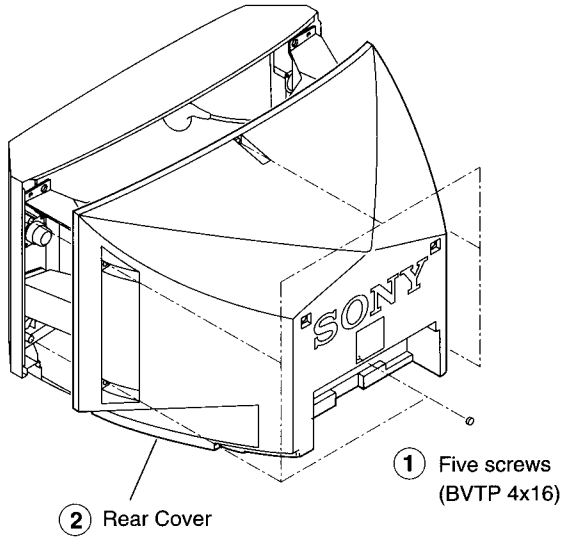
Here are some simple solutions to problems which may affect the picture and sound.

Problem	Solution
No picture (screen is dark), no sound	• Plug the TV in. • Press 1 I on the TV. (If indicator H is on, press 6 or a programme number 28 on the Remote Commander.) • Check the aerial connection. • Check if the selected video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using 1 I.
Poor or no picture (screen is dark), but good sound	• Press 25 to enter the PICTURE CONTROL menu and adjust »Brightness«, »Contrast« and »Colour«.
Poor picture quality when watching an RGB video source	• Press 20 repeatedly to select .
Good picture but poor or no sound	• Press +15. • If is displayed on the screen, press 1. • Check the connections of the loudspeakers.
No colour for colour programmes	• Press 25 to enter the PICTURE CONTROL menu, select RESET, then press joystick 17.
Remote Commander does not function.	• Replace batteries.

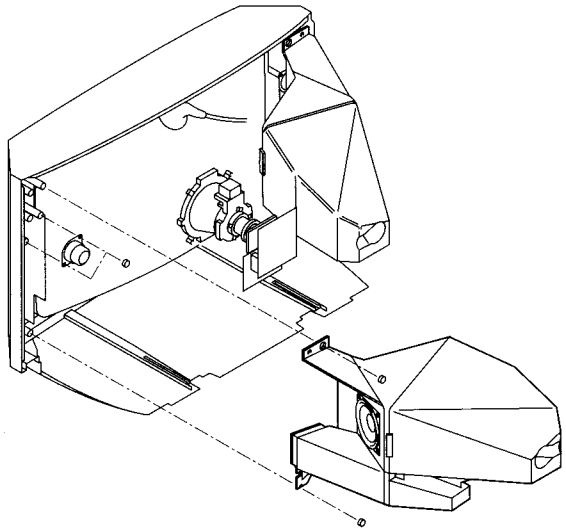
If you continue to have problems, have your TV serviced by qualified personnel. Never open the casing yourself.

SECTION 2
DISASSEMBLY

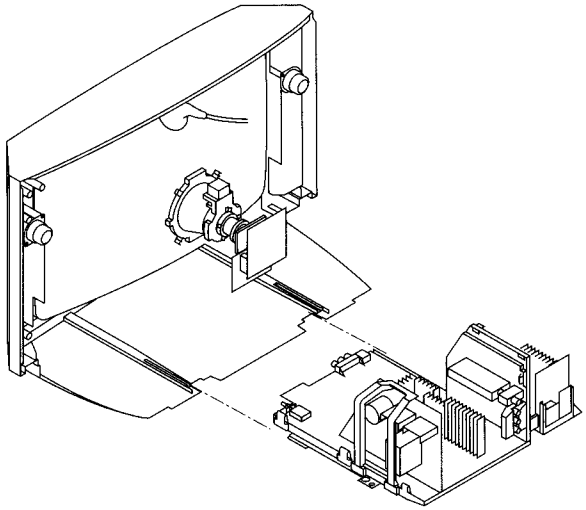
2-1. REAR COVER REMOVAL



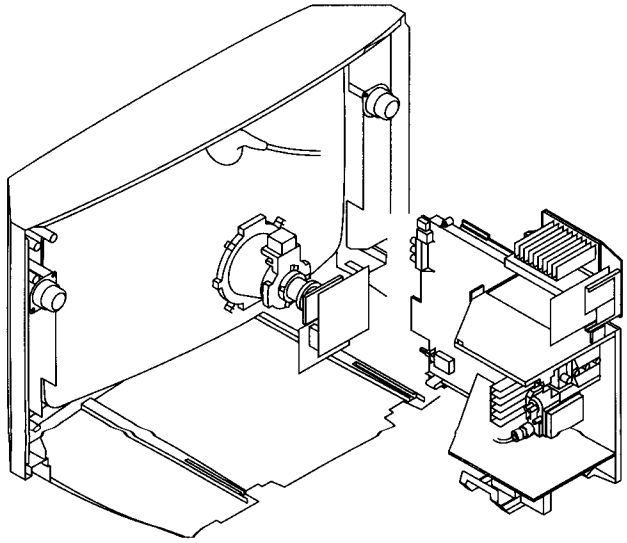
2-2. SPEAKER REMOVAL



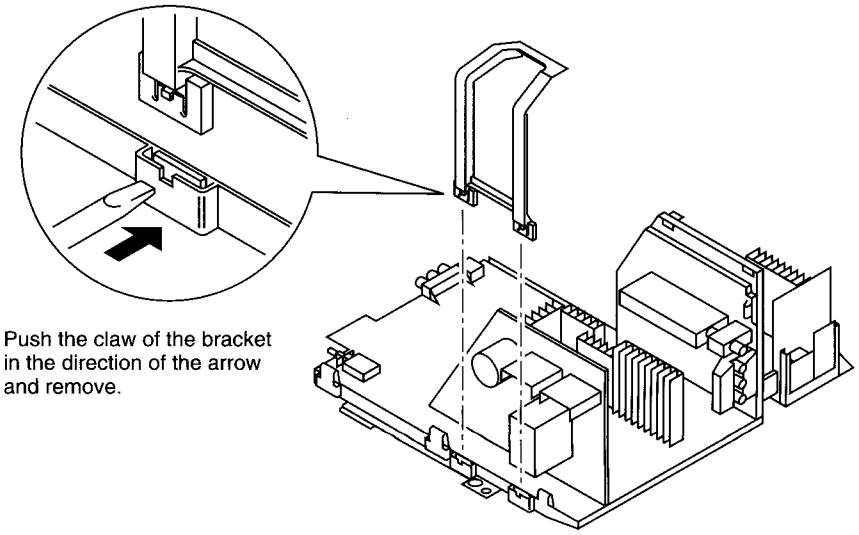
2-3. CHASSIS ASSY REMOVAL



2-4. SERIVCE POSITION

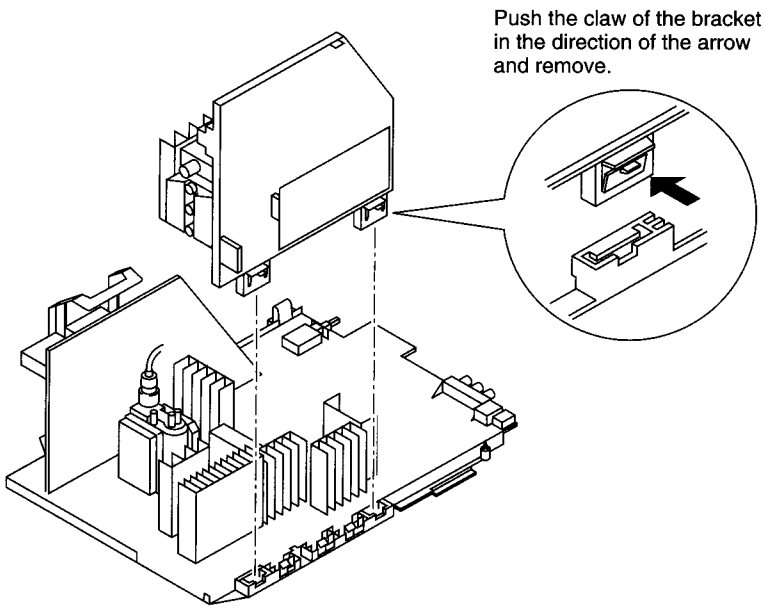


2-5. G BOARD REMOVAL

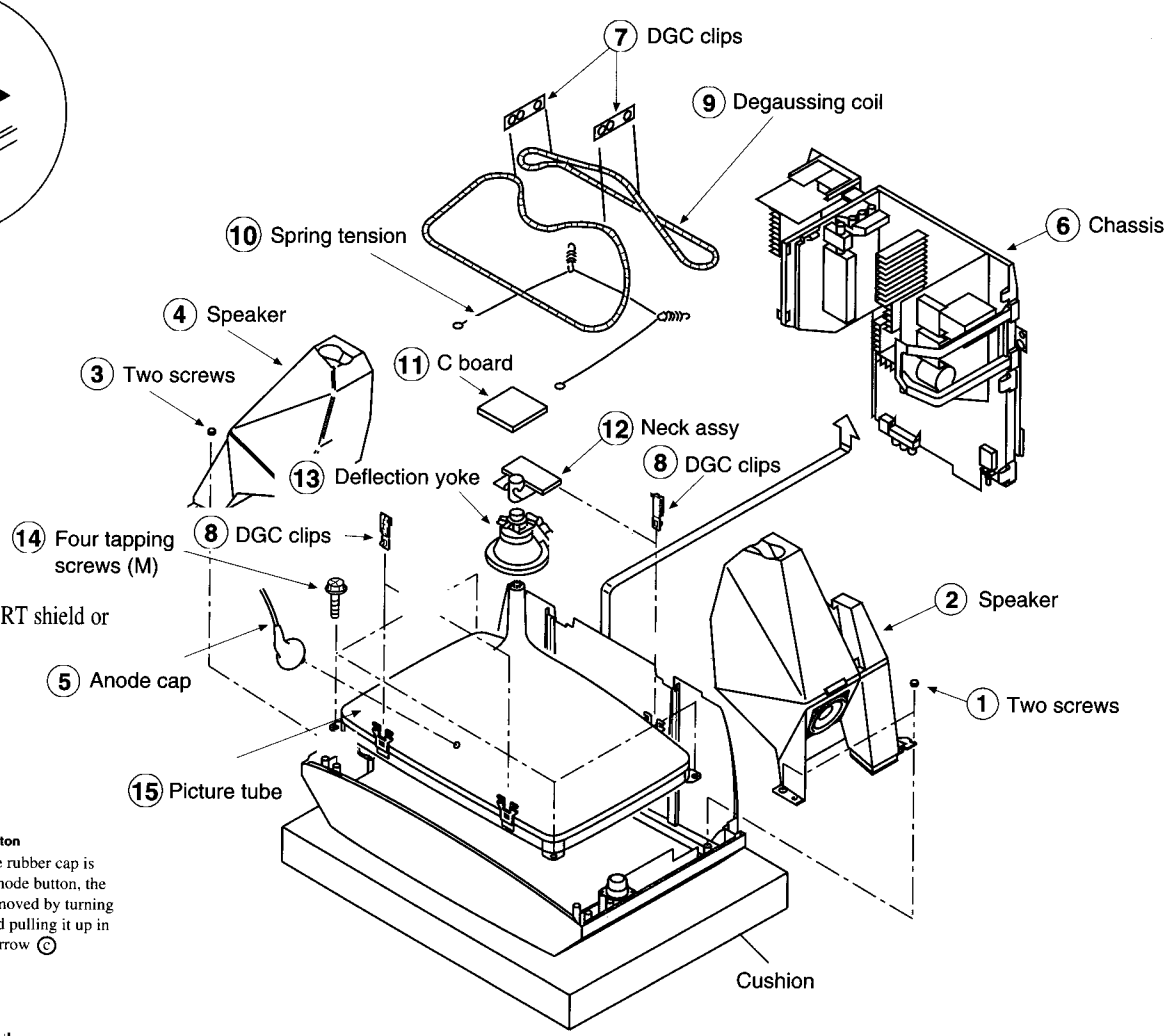


Push the claw of the bracket in the direction of the arrow and remove.

2-6. A BOARD REMOVAL



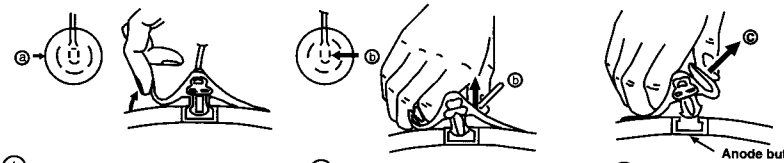
2-7. PICUTRE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* **REMOVING PROCEDURES.**



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

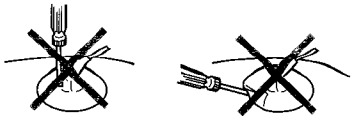
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ

• HOW TO HANDLE AN ANODE-CAP

① Don't damage the surface of anode-cap with sharp shaped material !

② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.

③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



REMOVAL AND REPLACEMENT OF THE MAIN-BRACKET *BOTTOM PLATES.*

(1) REMOVING THE PLATES

In the event of servicing being required to the solder side of the D Board printed circuit, the bottom plates fitted to the main chassis bracket require to be removed. This is performed by cutting the gates with a sharp wire cutter at the locations shown and indicated by arrows.

Note : There are 5 plates fitted to the main bracket and secured by 4 or 6 gates. Only remove the necessary plate to gain access to the circuit board.

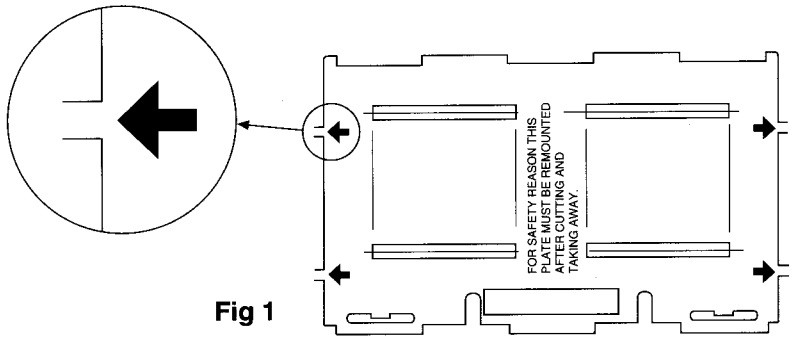


Fig 1

[redacted]

(2) REFITTING THE PLATES

Because the plates differ in size it is important that the correct plates are refitted in their original location.
The plates are identified by markings A-B-C-D-E on their top side.

1. Identify the plate by locating its marking.
2. Turn the plate over noting where the marking is located.
3. Locate the corresponding marking indicated on the main chassis bracket. See Fig 2.
4. Refit the plate as indicated in Fig 3 with the markings located next to each other.

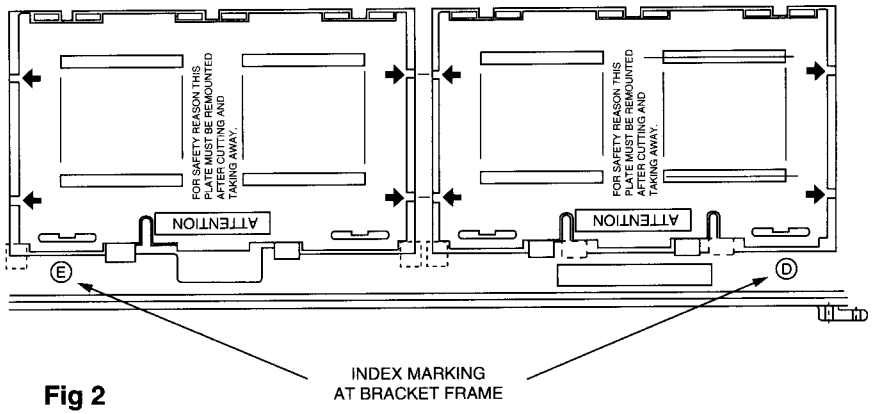


Fig 2

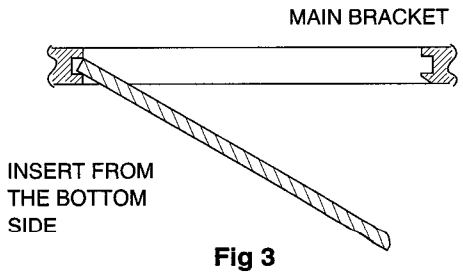


Fig 3

In the event of the plates requiring to be removed at a later stage, this can be achieved by inserting a screwdriver in the snap-recess indicated as in Fig 4 and lifting out.

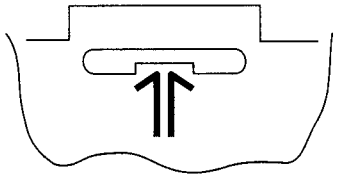


Fig 4

SECTION 3
SET-UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there are specific instructions to the contrary, carry out these adjustment with the rated power supply.
- Unless there are specific instructions to the contrary, set the controls and switches as follows.

Contrast ..... normal
Brightness ..... normal

- Carry out the following adjustments in this order:

3-1. Beam landing
3-2. Convergence
3-3. Focus
3-4. White balance

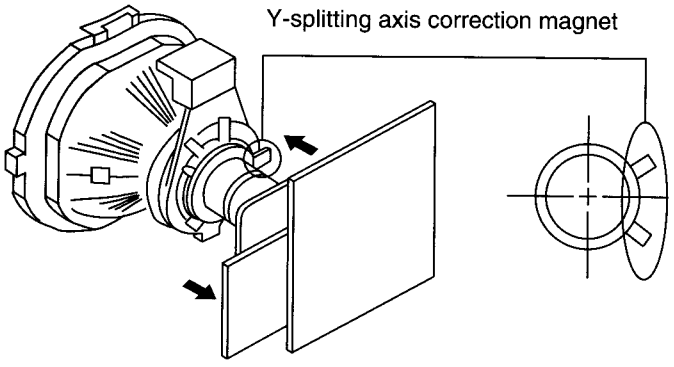
Note: Testing equipment required.
1. Color bar/pattern generator
2. Degausser
3. Vector scope

3-1. BEAM LANDING

Preparation:
1. In order to reduce the influence of geomagnetism on the set's picture tube face it in an easterly or westerly direction.
2. Switch on the set's power and degauss with the degausser.

(1) Adjustment of Correction Magnet for Y-Splitting Axis

1. Input a crosshatch signal from the pattern generator.
2. Picture control is minimum and brightness control is still normal.
3. Position the neck assy as shown in Fig. 3-2.
4. Move the deflection yoke forward to touch the CRT and it stands up rightly.
5. Adjust the upper pin and the lower pin symmetrically by opening or closing the Y-splitting axis correction magnets on the neck assy.
6. Return the deflection yoke to its original position.



(2) Landing

Note: Before carrying out the following adjustments adjust the magnets as indicated below (See Fig.3-3).
1. Input an all-white signal from the pattern generator. Maximize the picture setting and adjust the brightness setting.
2. Rough-adjust the focus and horizontal convergence.
3. Loosen the deflection yoke screws, align the purity adjustment knob to the central position. (See Fig. 3-1)
4. Switch from the all-white pattern to an all-green pattern.
5. Move the deflection yoke backwards and adjust with the purity magnet so that the green is at the center and it aligns symmetrically. (See Fig. 3-4)
6. Move the deflection yoke forward and adjust so that entire screen becomes green.
7. Switch the raster signal to red, then to blue and verify the landing condition.
8. When the position of the deflection yoke has been determined, fasten the deflection yoke with the screw.
9. If the beam does not land correctly in all the corners, use magnets to correct it. (See Fig. 3-5)

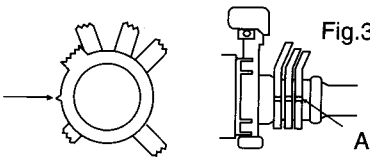


Fig.3-3

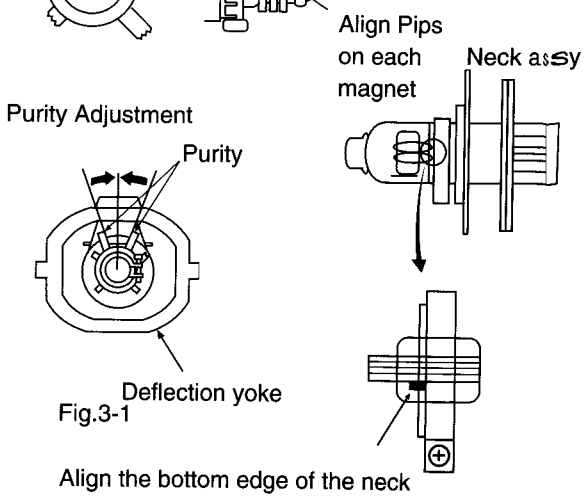


Fig.3-1

Align the bottom edge of the neck assy with the G3 hole center.

Fig.3-2

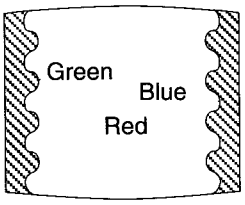


Fig.3-4

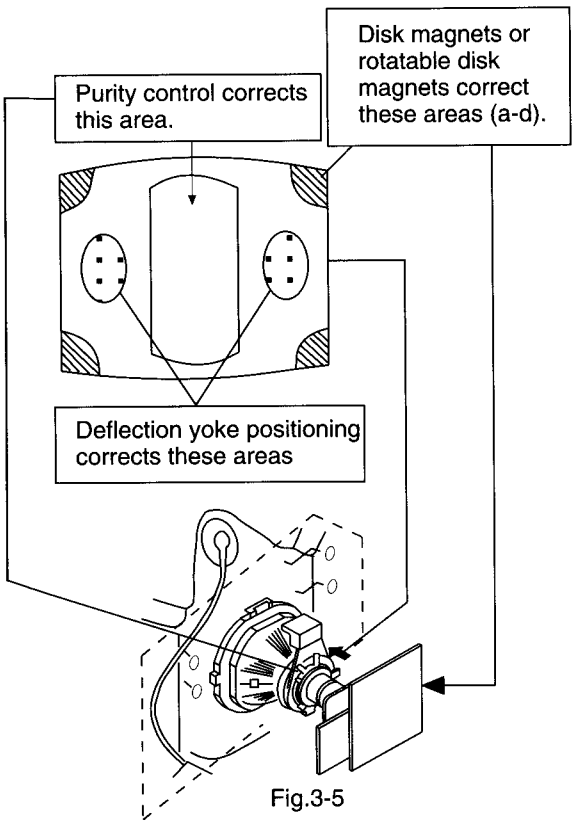
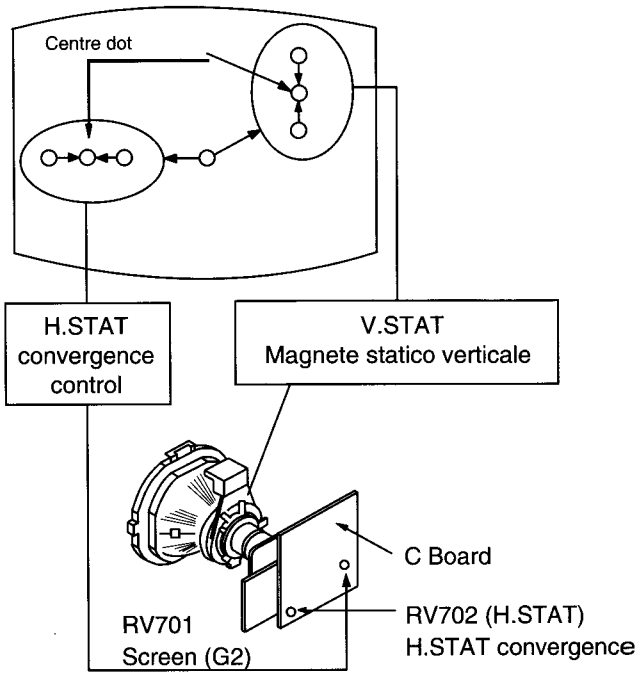


Fig.3-5

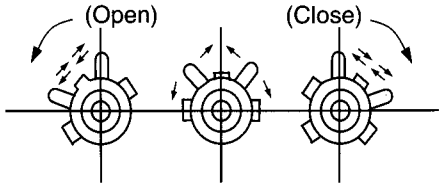
3-2. CONVERGENCE

(1) Screen center convergence (Static convergence)

1. Input a dot signal from the pattern generator. Normalize the picture setting.
2. (Moving horizontally), adjust the H.STAT control so that the horizontal red, green and blue dots coincide at the center of screen.
3. (Moving vertically), adjust the V.STAT magnet so that the vertical red, green and blue points coincide at the center of screen.

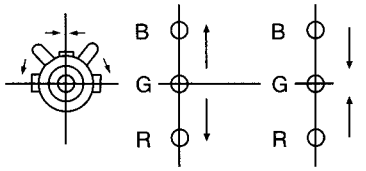


- If the horizontal dots are unable to coincide with the variable range of the H.STAT convergence, adjust together with the V.STAT convergence while tracking. (Adjust the convergence by tilting the V.STAT convergence or by opening or closing the V.STAT convergence.)

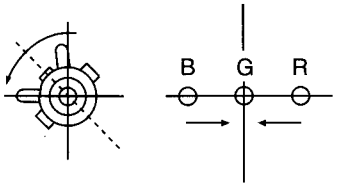


4. Movement of the red, green and blue dots by tilting the V.STAT magnet and by opening or closing the V.STAT magnet.

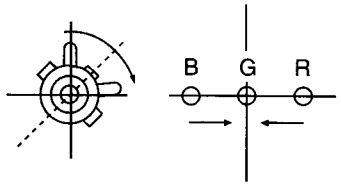
① By opening or closing the V.STAT magnet, the red, green and blue points move as shown below



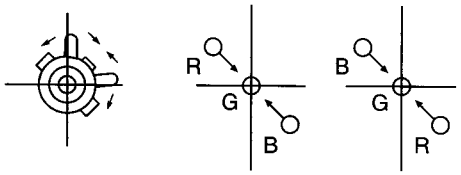
②By rotating the V. STAT magnet counterclockwise, the red, green and blue dots move as shown below.



③By rotating the V.STAT magnet clockwise, the red, green and blue dots move as shown below.



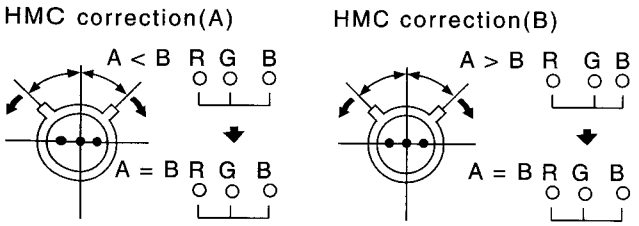
④By opening or closing the V.STAT magnet, the red, green and blue dots move as shown below.



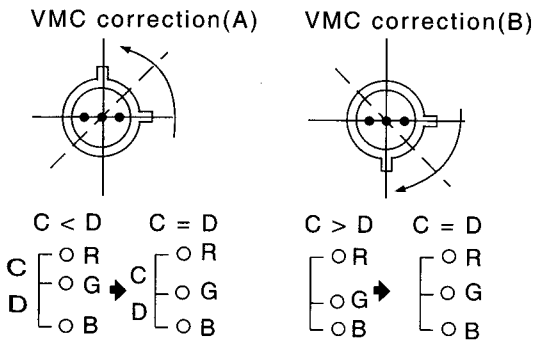
- If the blue dot does not coincide with the red and green points, correct the points by using the BMC (Hexapole) magnet.

⑤Correction for HMC (horizontal mis-convergence) and VMC (vertical mis-convergence) by using the BMC (Hexapole) magnet.

①HMC correction by BMC (Hexapole) magnet and movement of the electronic beam.



②VMC correction by BMC (Hexapole) magnet and movement of the electronic beam.



Layout of each control

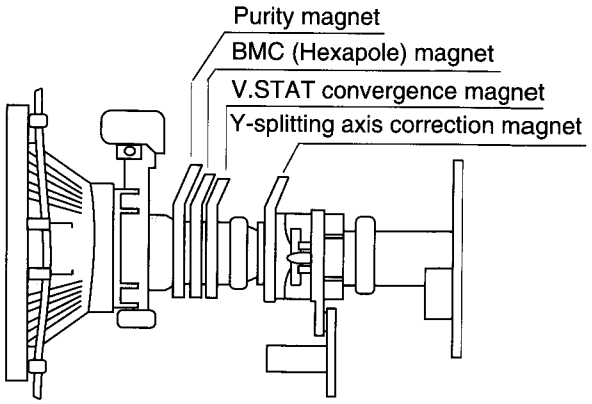
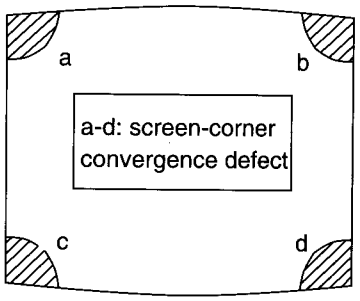
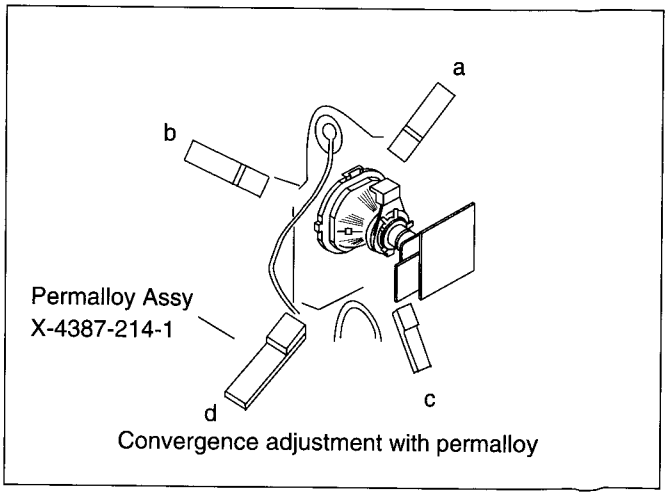


Fig.3-5

2. If you are unable to adjust the corner convergence properly, correct them with the use of permalloys.

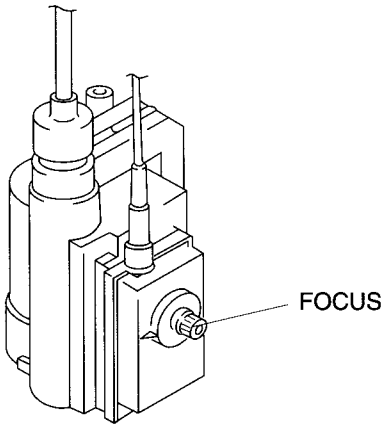




Convergence adjustment with permalloy

3-3. Focus

1. Receive a television broadcast signal.
2. Normalize the picture setting.
3. Adjust the focus control on the flyback transformer for the best focus at the center of the screen.
   Bring only the center area of the screen into focus, the magenta-ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.



3-4. Screen (G2), White balance (Adjustment in the service mode with remote commander)

G2 adjustment (RV702)

1. Input a dot signal from the pattern generator.
2. Set the Picture, Brightness and Colour to minimum.
3. Apply 170V DC from an external power supply to the R, G and B cathodes of the CRT.
4. Whilst watching the picture, adjust the G2 control RV701 [SCREEN] on the C board to the point just before the return lines disappear.

White balance adjustment

1. Receive an all-white signal.
2. Enter into the Service Mode by pressing ' TEST ', ' TEST ' and ' MENU' on the Service Commander.
3. Select ' VIDEO PROC. ' from the on screen menu display and press OK .
4. The ' VIDEO PROC TDA4780' menu will appear on the screen.

Video Proc. TDA4780

Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	31
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	63
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF

5. Set picture to MAX.
6. Set the ' R GAIN ' to 25.
7. Adjust the ' G GAIN ' and ' B GAIN ' so that the white balance becomes optimum.
8. Press the OK button to write the data for each item.
9. Set picture to MIN.
10. Set the ' R LVL REF ' to 31.
11. Adjust ' G LVL REF ', and ' B LVL REF ' with the left and right buttons so that the white balance becomes optimum.
12. Press the OK button to write the data for each item.

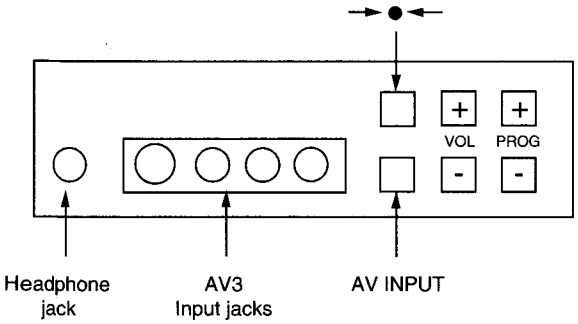
SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied remote commander, RM-862.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch of the set while pressing the PROG + (plus) and PROG - (minus) buttons on the front panel.



2. "TT" will appear on the upper right corner of the screen.
3. Press " MENU " on the commander to get the service menu on screen.

DEVICES	
Init TV	
Pip, Lumisponder & Autoside	
Sub Adjust	
Video Proc	TDA4780
Col Dec Main	TDA9144
Deflect. Cont	SDA9361
Col Dec Sub	TDA9143
Feature Box	S87C654
AI	TDA9170
DA	SDA9280
Single PIP	SDA9288
Sound	
Line23 det	

4. Push the joystick up (green) or down (blue) on the remote commander to select the adjustment item.
5. Press the center button to proceed to the next menu.
6. If the adjustment item is 'Video Proc.', push the down button to move to 'Video Proc.'.
7. The Menu as indicated in Fig 4-3 will appear on the screen.
8. Move the joystick up or down to move to the adjustment item and press the center (OK) button.
9. Change the data in order to comply with each standard.

Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	31
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	63
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF
15	DATA BUFF	OFF
16	NTSC MATRIX	OFF
17	HDTV	OFF
18	FSBL	OFF
19	AUTO CUT OFF	ON
20	FSW 2 DIS	OFF
21	FSW 2	OFF
22	FSW 1 DIS	OFF
23	FSW 1	OFF
24	ADAPT BLACK	OFF
25	Y HIGH 1V	OFF
26	MOD2	OFF
27	BLUE STRETCH	OFF
28	VM OUT	OFF
29	PEAK DRV ABS	ON
30	TIME CNST PEAK LIMIT	OFF

Fig. 4-3

SDA9361 (VIDEO PROC.)

Item No	Adjustment item	Data Amount
1	HDE	ON
2	VR	0
3	RABL	ON
4	BLK DIS	OFF
5	2FH 2*LINE FRQ	ON
6	STANDBY MODE	OFF
7	VERTICAL	ON
8	BSE BLK SELECT	OFF
9	SSE START SCAN	OFF
10	SRSE START RED SCAN	OFF
11	GBE GUARD BAND	OFF
12	STE SCAN TIME TABLE	OFF
13	NSA SELF ADAPTION	ON
14	V SHIFT	ADJ
15	V SIZE	ADJ
16	V LIN	ADJ
17	V S-COR	ADJ
18	V EHT COMP	25" = 78 29" = 100 28" = 36 32" =
19	H SIZE	ADJ
20	PIN PHASE	ADJ
21	PIN AMP	ADJ
22	UP COR PIN	ADJ
23	LOW COR PIN	ADJ
24	H EHT COMP	25" = 78 29" = 100 28" = 36 32" =
25	H SHIFT	ADJ
26	V ANGLE	ADJ
27	V BOW	ADJ
28	PWM START	0

Item No	Adjustment item	Data Amount
29	D/A	0
30	V BLK TIME	0
31	H BLK TIME	0
32	STAR V SCAN	0
33	H BLK PHASE	0
34	V SCAN WIDTH 0	0
35	V SCAN WIDTH 1	0
36	GUARD BAND	0
37	START RED SCAN	0
38	NUMBER FIELDS	1
39	NI NON INTERLACE	OFF
40	NR VSYNC NOISE RED	ON
41	SCC WITH VBL	ON
42	MIN LINES/FIELD	0
43	MAX LINES/FIELD	0
44	AFC EHT COMP	0
45	PLL FREQ	6
46	VCR	ON
47	GEN MOD	OFF
48	HSWID	ON
49	INT H PHASE	239
50	PWM WIDTH	0
51	NOISY VCR	OFF
52	KILLZIP	OFF
53	TC3RD	OFF
54	BANDGAP 4 OFF	OFF
55	BANDGAP OFF	OFF
56	BANDGAP	0

TDA4780 (VIDEO PROC.)

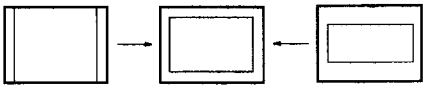
Item No	Adjustment item	Data Amount
1	BRT	USER CONTROL
2	COL	USER CONTROL
3	PIC	USER CONTROL
4	HUE	USER CONTROL
5	R GAIN	25
6	G GAIN	Adj
7	B GAIN	Adj
8	R LVL REF	31
9	G LVL REF	Adj
10	B LVL REF	Adj
11	PEAK DRV LIMIT	0
12	GAMMA	31
13	SCP ON = 3LEV OFF = 2LEV	ON
14	DELAY	OFF
15	DATA BUFF	OFF
16	NTSC MATRIX	OFF
17	HDTV	OFF
18	FSBL	OFF
19	AUTO CUT OFF	ON
20	FSW 2 DIS	OFF
21	FSW 2	OFF
22	FSW 1	OFF
23	FSW 1	OFF
24	ADAPT BLACK	OFF
25	Y HIGH 1V	OFF
26	MOD2	OFF
27	BLUE STRETCH	OFF
28	VM OUT	OFF
29	PEAK DRV ABS	ON
30	TIME CNST PEAK LIMIT	OFF

DEFLECTION SYSTEM ADJUSTMENT

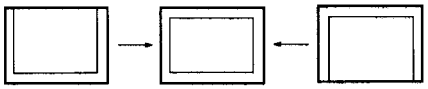
1. Enter into the service mode and select 'Deflect cont.'.The 'Deflect cont. SDA9361' adjustment menu will be displayed.
2. Select and adjust each item in order to get an optimum image.

Item No	Adjustment item	Data Amount
1	HDE	ON
2	VR	0
3	RABL	ON
4	BLK DIS	OFF
5	2FH 2*LINE FRQ	ON
6	STANDBY MODE	OFF
7	VERTICAL	ON
8	BSE BLK SELECT	OFF
9	SSE START SCAN	OFF
10	SRSE START RED SCAN	OFF
11	GBE GUARD BAND	OFF
12	STE SCAN TIME TABLE	OFF
13	NSA SELF ADAPTION	ON
14	V SHIFT	ADJ
15	V SIZE	ADJ
16	V LIN	ADJ
17	V S-COR	ADJ
18	V EHT COMP	25" = 78 29" = 100 28" = 36
19	H SIZE	ADJ
20	PIN PHASE	ADJ
21	PIN AMP	ADJ
22	UP COR PIN	ADJ
23	LOW COR PIN	ADJ
24	H EHT COMP	25" = 78 29" = 100 28" = 36
25	H SHIFT	ADJ
26	V ANGLE	ADJ
27	V BOW	ADJ
28	PWM START	0

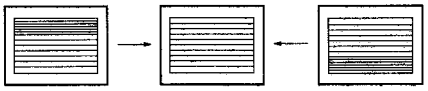
V SIZE



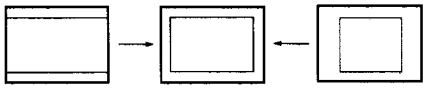
V POS



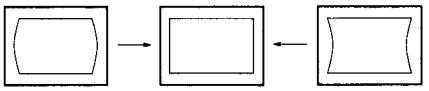
V LIN



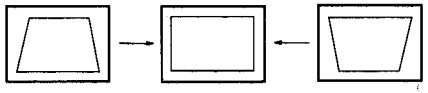
H SIZE



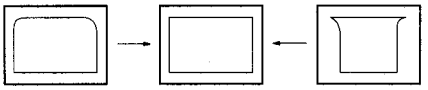
H PIN CUSH



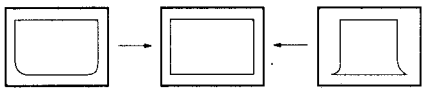
H TILT



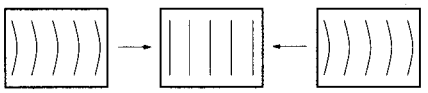
H UP COR



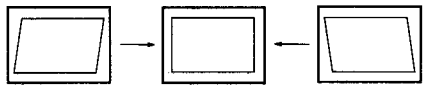
H LOWER COR



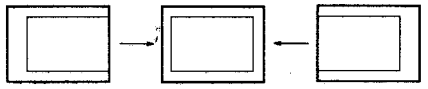
AFC V BOW



AFC V ANGLE



H POS



4-2. VOLUME ELECTRICAL ADJUSTMENTS

Sub Brightness Adjustment

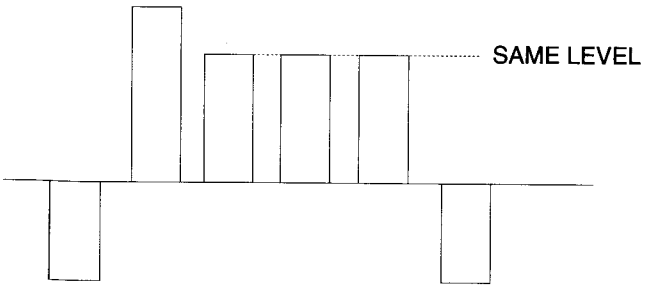
1. Enter Service Mode (Device Menu).
2. Select 'SUB ADJUST MENU'.

Sub adjustment
Sub Picture
Sub Color
Sub Brightness
4/3 Center
PAP H-Center
PAP HWE-Offset

3. Adjust the value according to the following advice.

Sub Color Adjustment

1. Input a PAL color bar signal.
2. Connect an oscilloscope to CN3703.
3. Enter into 'SERVICE MODE'.
4. Choose 'SUB ADJUST'.
5. Enter into Sub Color mode.
6. Adjust data so that the right sides of the waveforms are of equal height.



4-3. TEST MODE 2:

Is available by pressing the Test button twice, OSD "TT" appears. The functions described below are available by pressing the two numbers. To release Test Mode 2, press 0, 10, 20 ... twice or switch the TV into Standby Mode. Pressing the two Local Control buttons (+ and –) during Power ON will also switch into "TT" mode.

In TT mode, it is possible to remove the Menu from the screen by pressing the Speaker Off button once. Pressing the Speaker OFF button a second time will cause the menu to reappear . The Function is kept even when the menu is not displayed!!

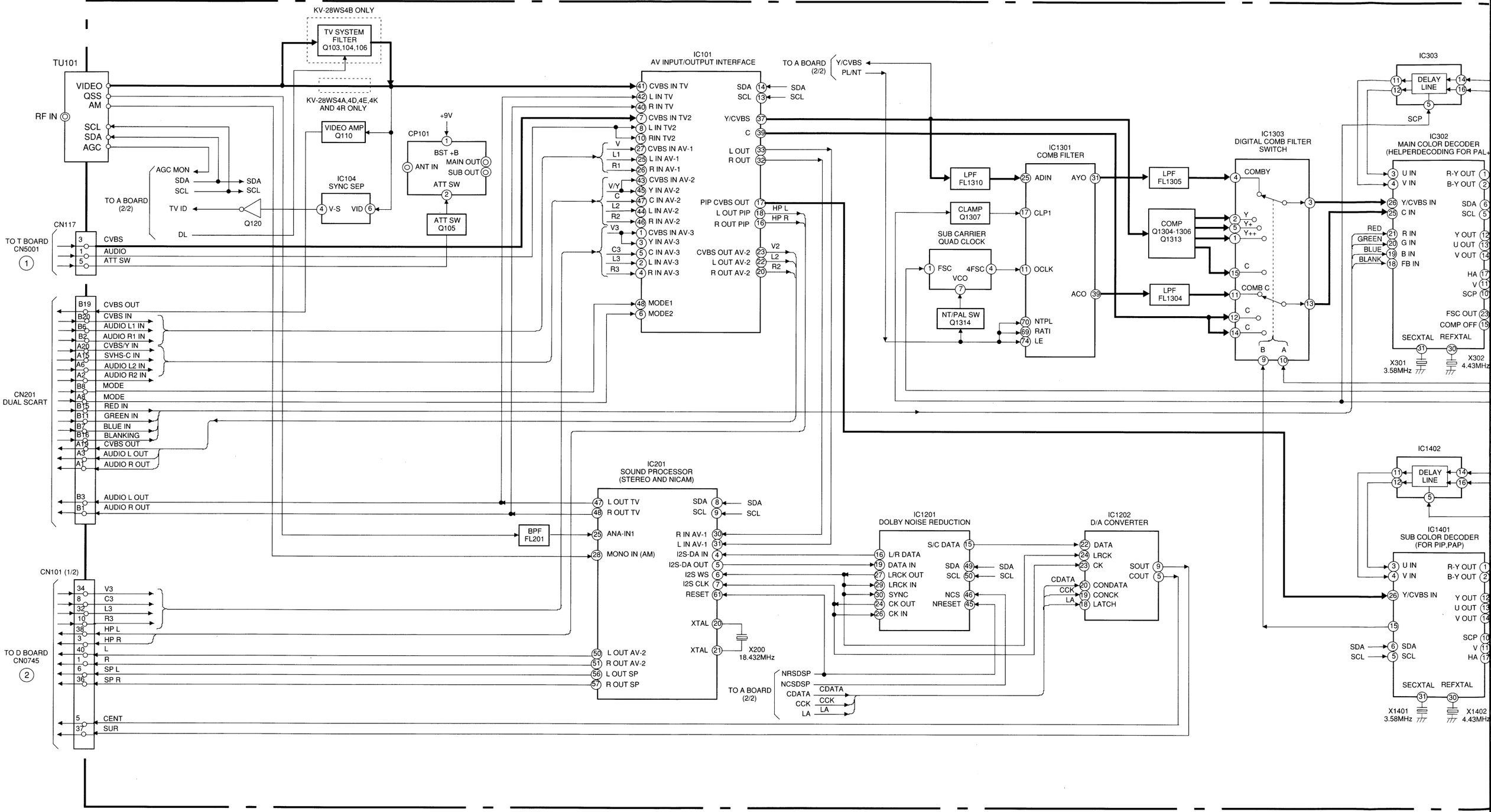
00	Switch back to normal mode - TT mode off
01	Switch service menu on
02	Direct access to Noise reduction
03	Set volume to 30%
04	Service menu in "Service Mode"
05	Service menu in "Production Mode"
06	Set Volume to 80%
07	Aging Mode
08	Shipping Condition
09	Language Reset
10	The TT number will be deleted
11	Direct access to Balance
12	Direct access to Hue
13	Display of TV set configuration
14	Production Info Display
15	Read Analog from ROM
16	Save Analog F in NVM
17	This function presets the Labels for the AV sources: AV1, RGB, AV2, YC2, AV3, YC3, AV4, YC4.
18	No function
19	No function
20	See TT10
21	Picture Rotation automatic function: (-4) -> (+4) -> 0
22	Error Monitor Display
23	Direct access to Sub Brightness Adjustment.
24	Direct access to Sub Colour.
25	Status Menu Display
26	Text Character selection (Char set 06 -> West Europe)
27	Text Character selection (Char set 38 -> East Europe)
28	Text Character selection (Char set 40 -> West Europe) US English
29	Text Character selection (Char set55 -> West Europe) Turkish
30	See TT10

31	no function
32	no function
33	no function
34	no function
35	no function
36	no function
37	no function
38	Screen Position
39	Reset Programme Table
40	See TT10
41	Picture Min
42	no function
43	no function
44	no function
45	Set NVM to Protect mode
46	IR Channel Pressetting Mode. The channel pressetting can be done by a Special transmitter. Sequence: TT46 -> --PR Number select display appears Select Prog. No. from where the channel shall be stored. --> Now TV is waiting for IR sequence <-- --> If no IR transmission starts TT46 is released after 20 secs <--! Note: when TT46 is active, any transmission will be interpreted as PROG data !
47	no function
48	no function
49	New Initialize
50	See TT10
51	Strobo mode is activated.
52	no function
53	no function
54	Direct access to Velocity Modulation VM (Production use)
55	Slicer High
56	Slicer No
57	Megatext Service Menu on
58	MTX Small Framing Code Window

59	MTX Wide Framing Code Window
60	See TT10
61	no function
62	no function
63	no function
64	Reset all IIC Slave commands (Production use)
65	Reset stored error codes in NVM
66	Feature box and Pal Plus
67	no function
68	Ignore Errors - on
69	Ignore errors - off
70	See TT10
71	no function
72	no function
73	Megatext RGB textlevel one step decreased.
74	Megatext RGB textlevel one step decreased (max 1 steps down starting from E0h) (Production use)
75	no function
76	CDA9360
77	SDA9280
78	PIP
79	no function
80	See TT10
81	S87C654 Default data setting
82	TDA9170 Default data setting
83	SAA 7185WP Default data setting
84	TDA4780 Default data setting
85	TDA9144 Default data setting
86	TDA9143 Default data setting
87	SDA9288 Default data setting
88	Char set Russian
89	Char set Russian (esc)
90	See TT10

SECTION 5
DIAGRAMS

BLOCK DIAGRAM (1)



BLOCK DIA

A (1/2)

AV INPUT/OUTPUT INTERFACE,
DIGITAL COMB FILTER, COLOR DECODER,
SOUND PROCESSOR,
DOLBY NOISE REDUCTION,
MICRO CONTROLLER, MEGA TEXT

IC101
PUT/OUTPUT INTERFACE

TO A BOARD (2/2)
Y/CVBS
PL/NT

SDA 14 SDA
SCL 13 SCL
Y/CVBS 37
C 39
L OUT 33
R OUT 32
PIP CVBS OUT 17 HP L
L OUT PIP 18 HP R
R OUT PIP 16
CVBS OUT AV-2 23 V2
L OUT AV-2 22 L2
R OUT AV-2 20 R2

IC1301
COMB FILTER

LPF FL1310
CLAMP Q1307
SUB CARRIER QUAD CLOCK
FSC 1 4FSC 4
VCO 7
NT/PAL SW Q1314
25 ADIN
17 CLP1
11 OCLK
70 NTPL
69 RATI
74 LE
AYO 31
ACO 39

LPF FL1305
COMP Q1304-1306 Q1313
LPF FL1304

IC1303
DIGITAL COMB FILTER SWITCH

COMBY 4
Y 2
Y+ 5
Y++ 1
C 15
COMB C 11
C 12
C 14
B 9
A 10
3
13

IC303
DELAY LINE
11 12 14 16
5
SCP

IC302
MAIN COLOR DECODER
(HELPERDECODING FOR PAL+)

3 U IN
4 V IN
26 Y/CVBS IN
25 C IN
RED 21 R IN
GREEN 20 G IN
BLUE 19 B IN
BLANK 18 FB IN
R-Y OUT 1
B-Y OUT 2
SDA 6
SCL 5
Y OUT 12
U OUT 13
V OUT 14
HA 17
V 11
SCP 10
FSC OUT 23
COMP OFF 15
SECXTAL 31
REFXTAL 30
X301 3.58MHz
X302 4.43MHz

SDA SCL

IC304
ARTIFICIAL INTELLIGENCE

30 SDA
31 SCL
12 Y IN
5 U IN
7 V IN
10 SCP
Y OUT 21
U OUT 28
V OUT 26

OUTPUT AMP Q315-317

CN310
Y50M 1
U50M 3
V50M 5
HAM 6
SCP50M 7
VP50M 8
COMP OFF 9

TO B BOARD CN1810 (3)

COMP SW Q318

IC1402
DELAY LINE
11 12 14 16
5

IC1401
SUB COLOR DECODER
(FOR PIP,PAP)

3 U IN
4 V IN
26 Y/CVBS IN
15
SDA 6 SDA
SCL 5 SCL
R-Y OUT 1
B-Y OUT 2
Y OUT 12
U OUT 13
V OUT 14
SCP 10
V 11
HA 17
SECXTAL 31
REFXTAL 30
X1401 3.58MHz
X1402 4.43MHz

OUTPUT AMP Q1401-1403

CN1411
Y50P 1
V50P 5
U50P 3
SCPS50P 7
VP50P 8
HAP 6

TO B BOARD CN1811 (4)

CN2012
6 BLK TXT
8 VP100
7 HP100
10 TXT CLK
1 R TXT
3 G TXT
5 B TXT

TO B BOARD CN412 (6)

TO A BOAR (1/2)

SSOR ICAM)

SDA 8 SDA
SCL 9 SCL
R IN AV-1 30
L IN AV-1 31
I2S-DA IN 4
S-DA OUT 5
I2S WS 6
I2S CLK 7
RESET 61
XTAL 20
XTAL 21
X200 18.432MHz

IC1201
DOLBY NOISE REDUCTION

S/C DATA 15
16 L/R DATA
19 DATA IN
27 LRCK OUT
29 LRCK IN
30 SYNC
24 CK OUT
26 CK IN
SDA 49 SDA
SCL 50 SCL
NCS 46
NRESET 45

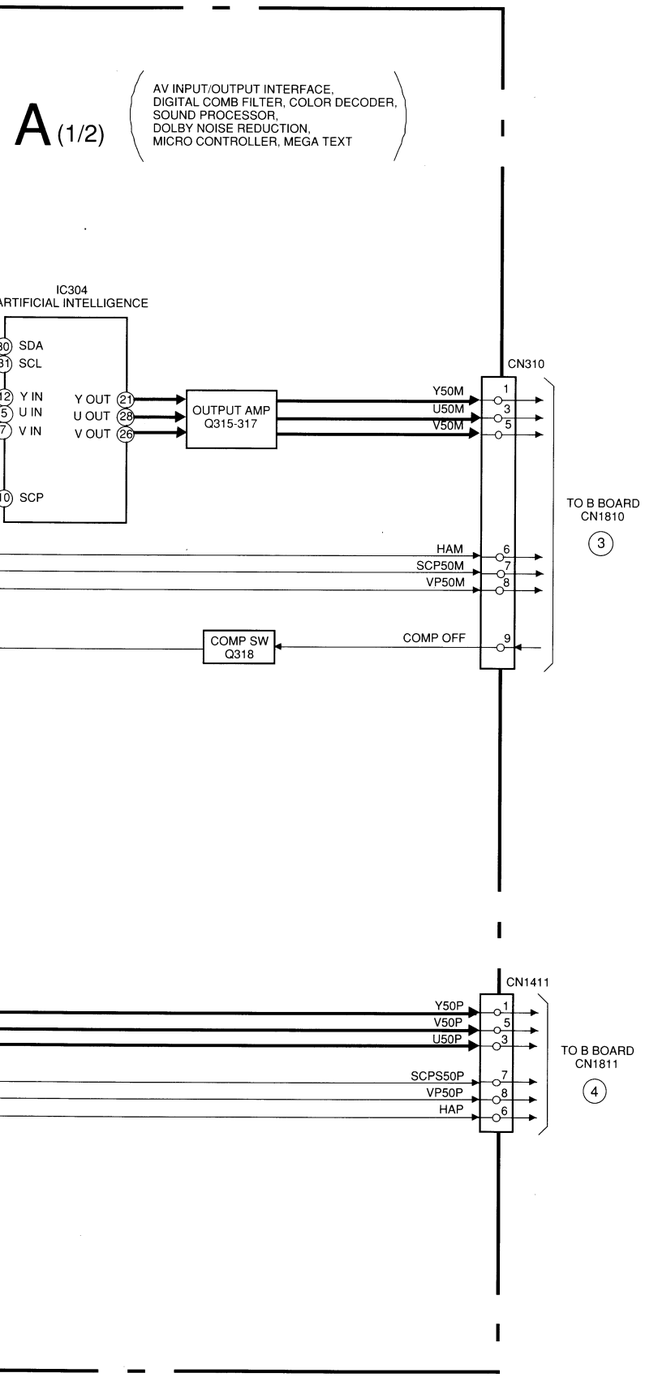
IC1202
D/A CONVERTER

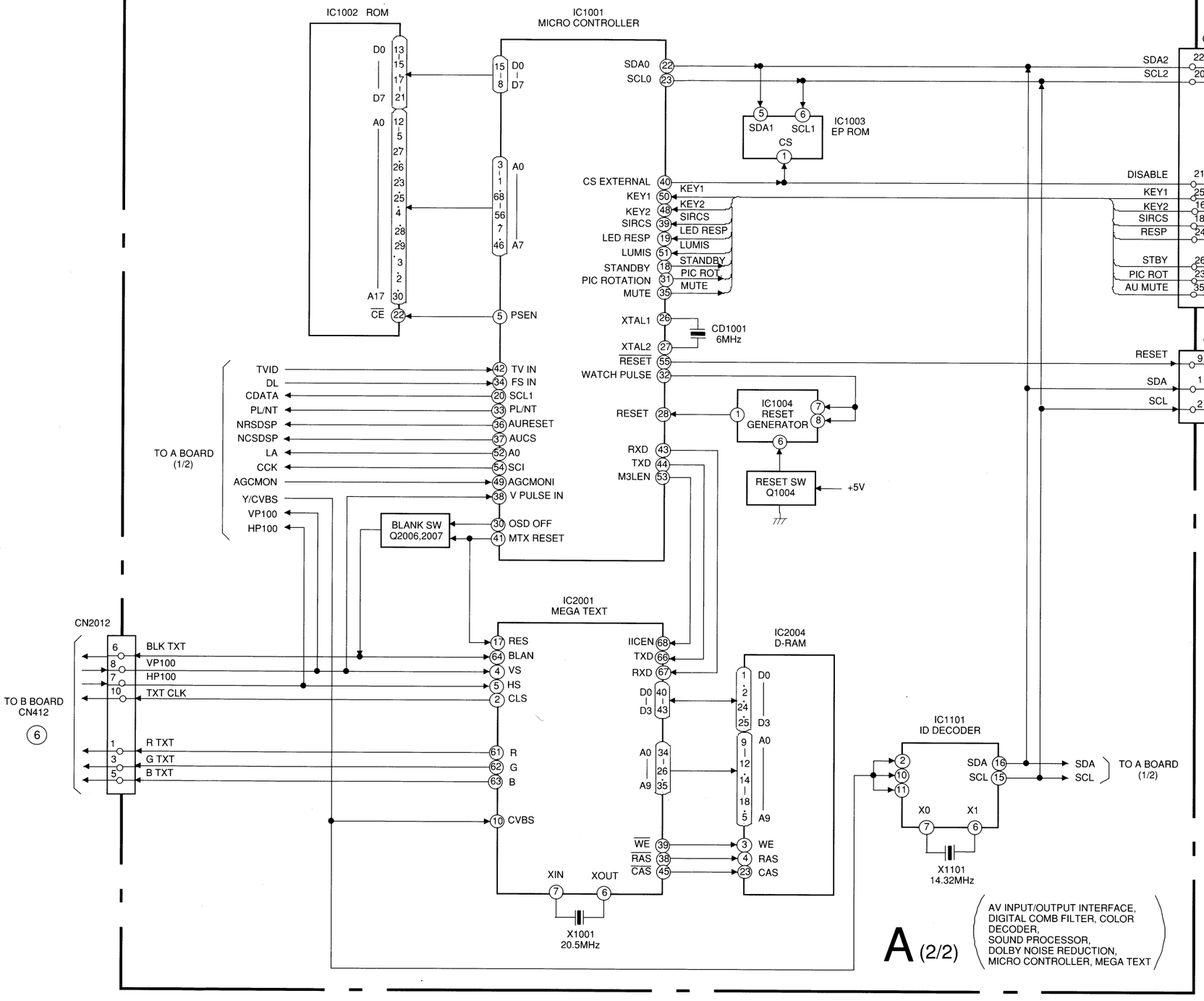
22 DATA
24 LRCK
23 CK
20 CONDATA
19 CONCK
18 LATCH
SOUT 9
COUT 5
CDATA
CCK
LA

NRSDSP
NCSDSP
CDATA
CCK
LA

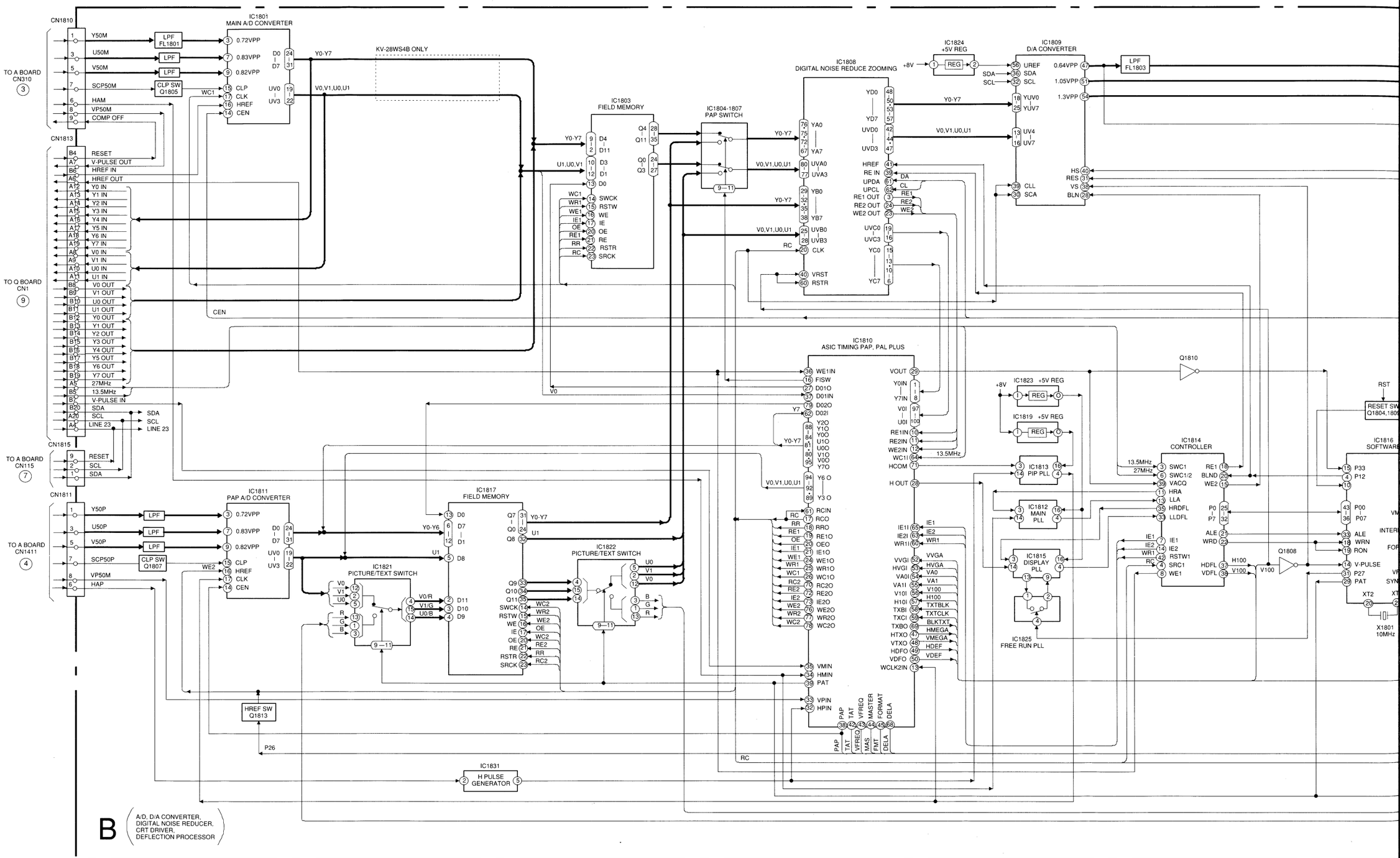
TO A BOARD (2/2)

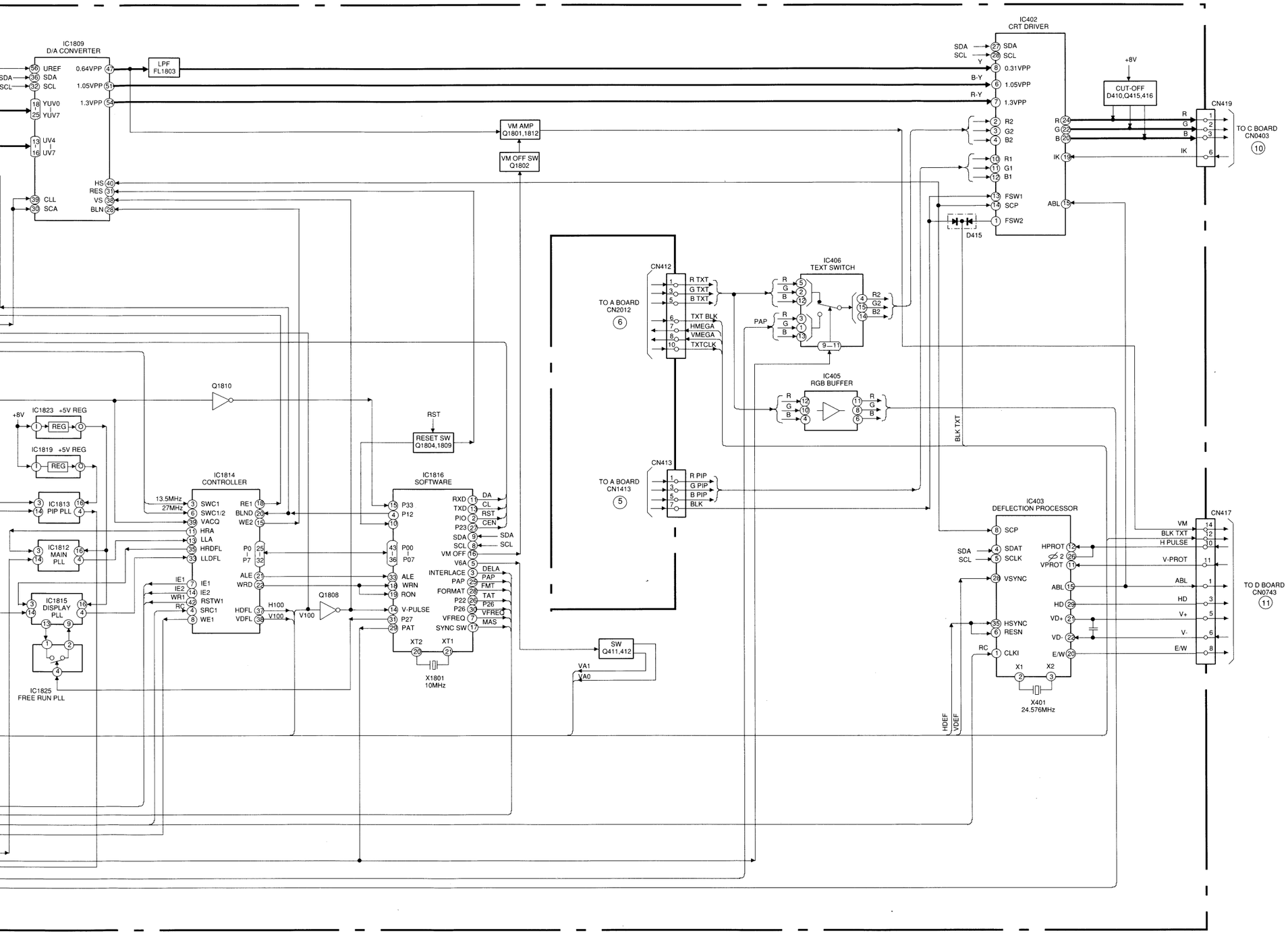
BLOCK DIAGRAM (2)



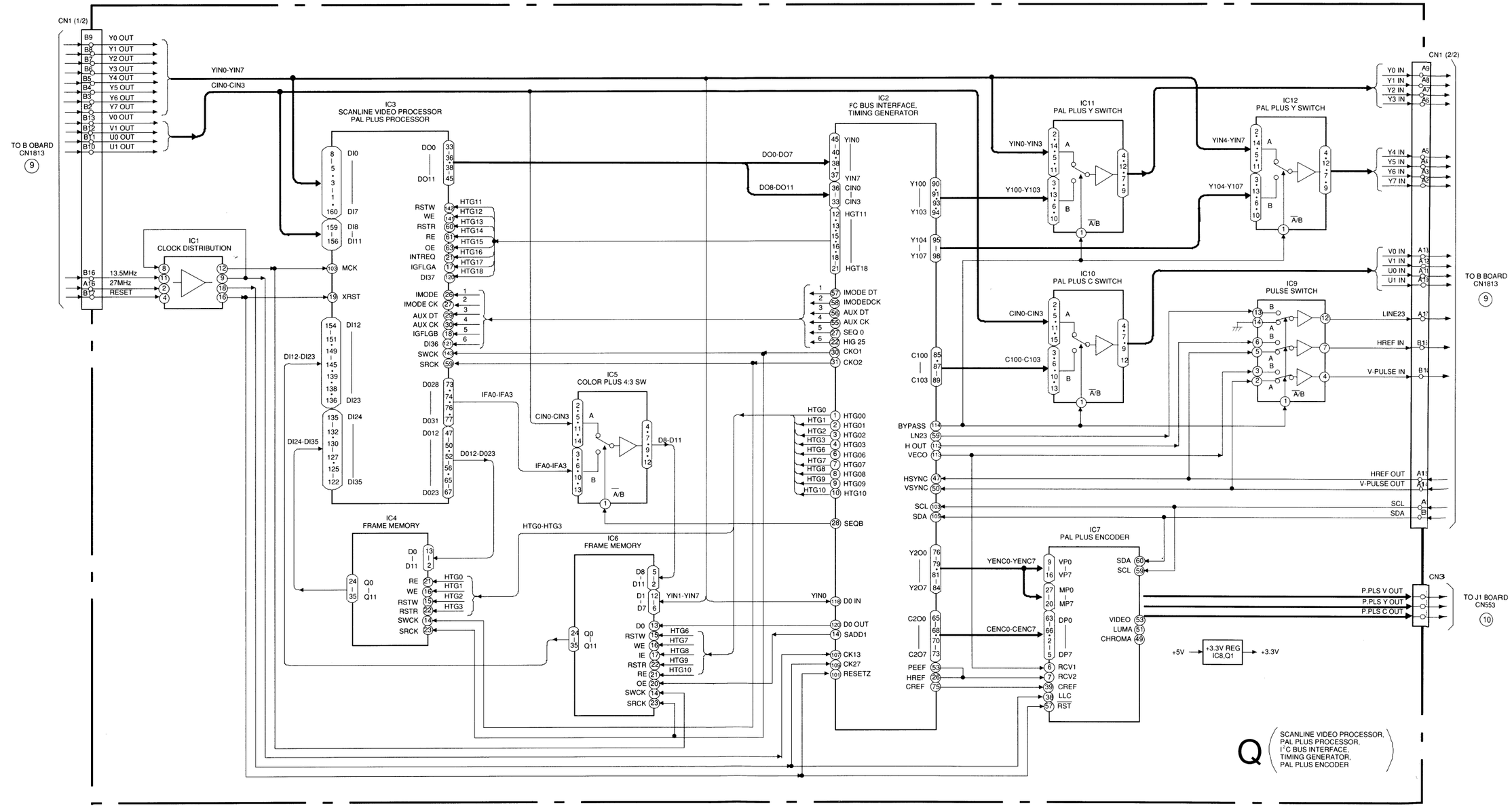


BLOCK DIAGRAM (3)

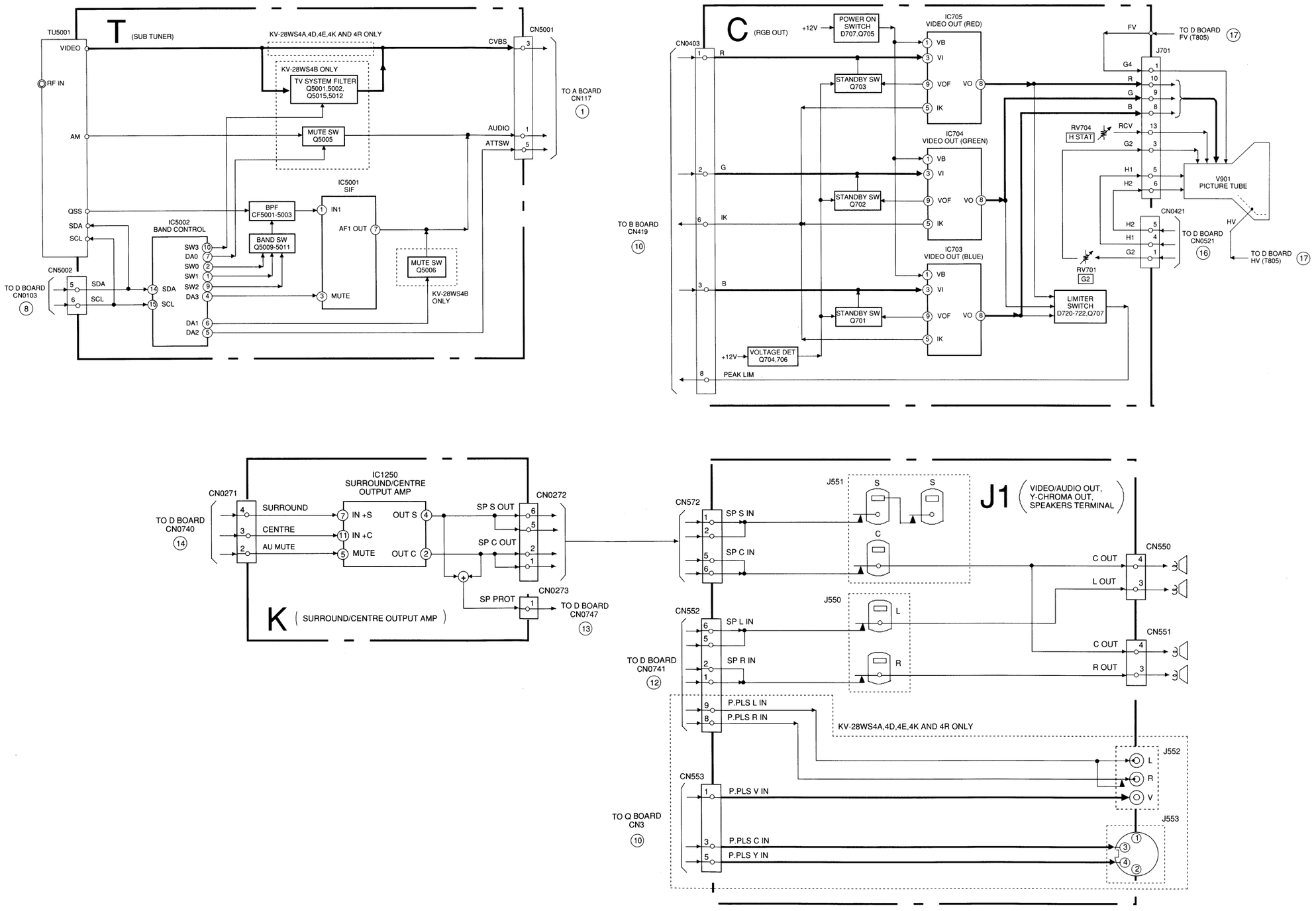



IC1809
D/A CONVERTER
UREF
SDA
SCL
YUV0
YUV7
UV4
UV7
CLL
SCA
0.64VPP
1.05VPP
1.3VPP
HS
RES
VS
BLN
LPF
FL1803
VM AMP
Q1801,1812
VM OFF SW
Q1802
IC402
CRT DRIVER
SDA
SCL
Y
B-Y
R-Y
0.31VPP
1.05VPP
1.3VPP
R2
G2
B2
R1
G1
B1
FSW1
SCP
FSW2
D415
+8V
CUT-OFF
D410,Q415,416
CN419
TO C BOARD
CN0403
IK
ABL
CN412
TO A BOARD
CN2012
R TXT
G TXT
B TXT
TXT BLK
HMEGA
VMEGA
TXTCLK
IC406
TEXT SWITCH
PAP
IC405
RGB BUFFER
BLK TXT
CN413
TO A BOARD
CN1413
R PIP
G PIP
B PIP
BLK
Q1810
RST
RESET SW
Q1804,1809
IC1823 +5V REG
IC1819 +5V REG
IC1813
PIP PLL
IC1812
MAIN
PLL
IC1815
DISPLAY
PLL
IC1825
FREE RUN PLL
IC1814
CONTROLLER
13.5MHz
27MHz
SWC1
SWC1/2
VACQ
HRA
LLA
HRDFL
LLDFL
IE1
IE2
RSTW1
SRC1
WE1
RE1
BLND
WE2
P0
P7
ALE
WRD
HDFL
VDFL
H100
V100
Q1808
IC1816
SOFTWARE
P33
P12
P00
P07
ALE
WRN
RON
V-PULSE
P27
PAT
RXD
TXD
PIO
P23
SDA
SCL
VM OFF
V6A
INTERLACE
PAP
FORMAT
P22
P26
VFREQ
SYNC SW
DA
CL
RST
CEN
DELA
PAP
FMT
TAT
P26
VFREQ
MAS
XT2
XT1
X1801
10MHz
SW
Q411,412
VA1
VA0
IC403
DEFLECTION PROCESSOR
SCP
SDAT
SCLK
VSYNC
HSYNC
RESN
CLKI
HPROT
VPROT
ABL
HD
VD+
VD-
E/W
X1
X2
X401
24.576MHz
HDEF
VDEF
CN417
VM
BLK TXT
H PULSE
V-PROT
ABL
HD
V+
V-
E/W
TO D BOARD
CN0743

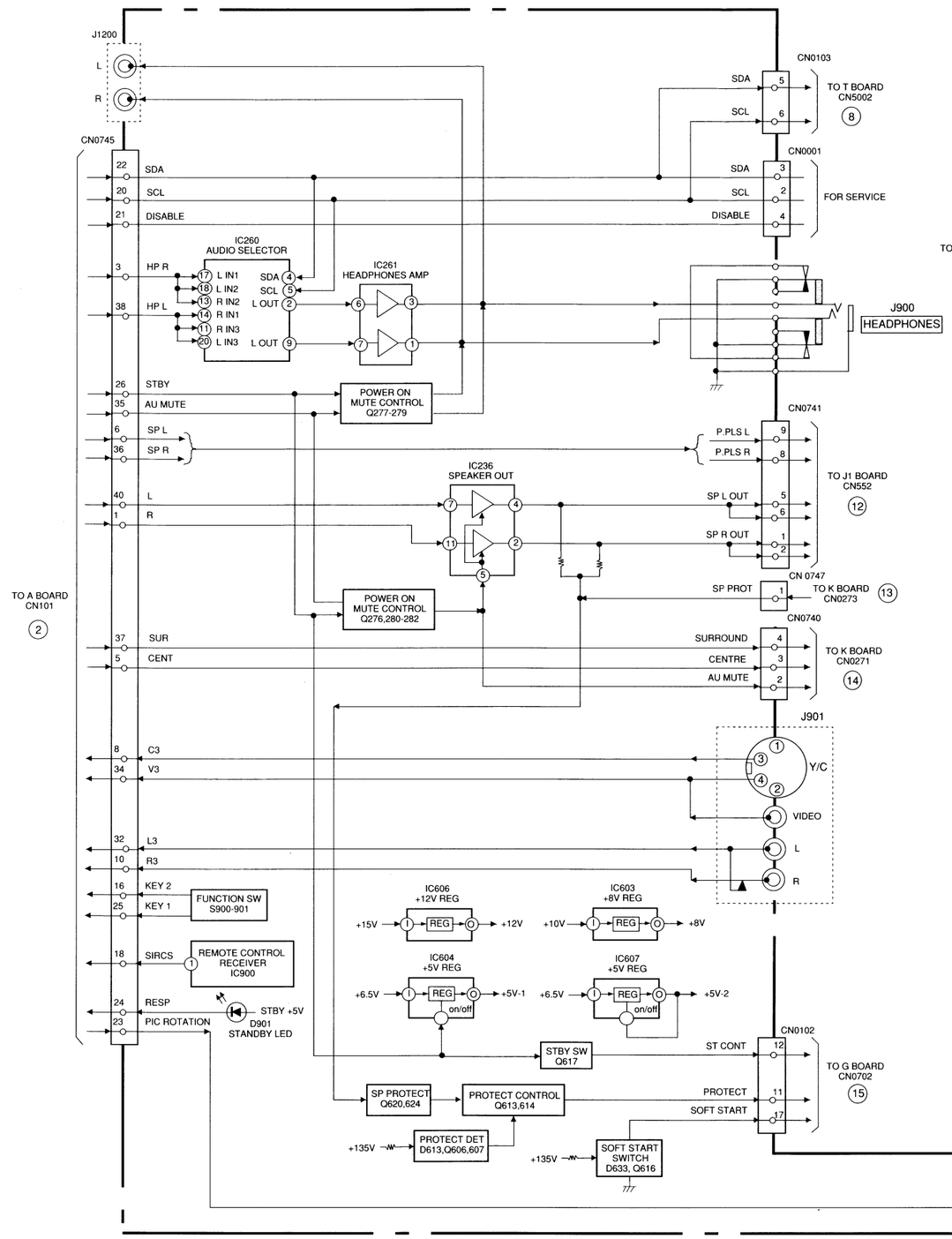
BLOCK DIAGRAM (4) (KV-28WS4A,4D,4E,4K and 4R only)

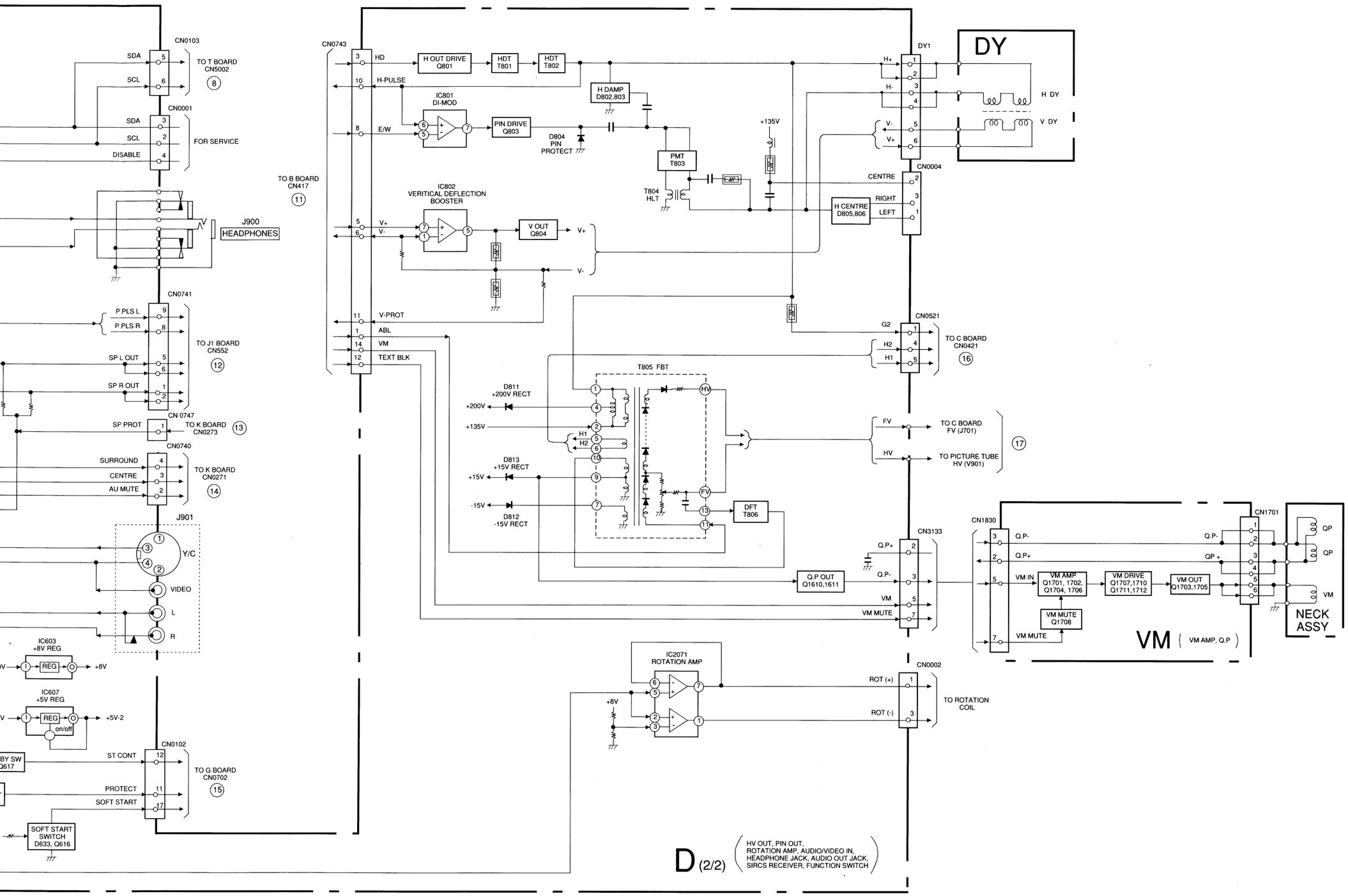


BLOCK DIAGRAM (5)

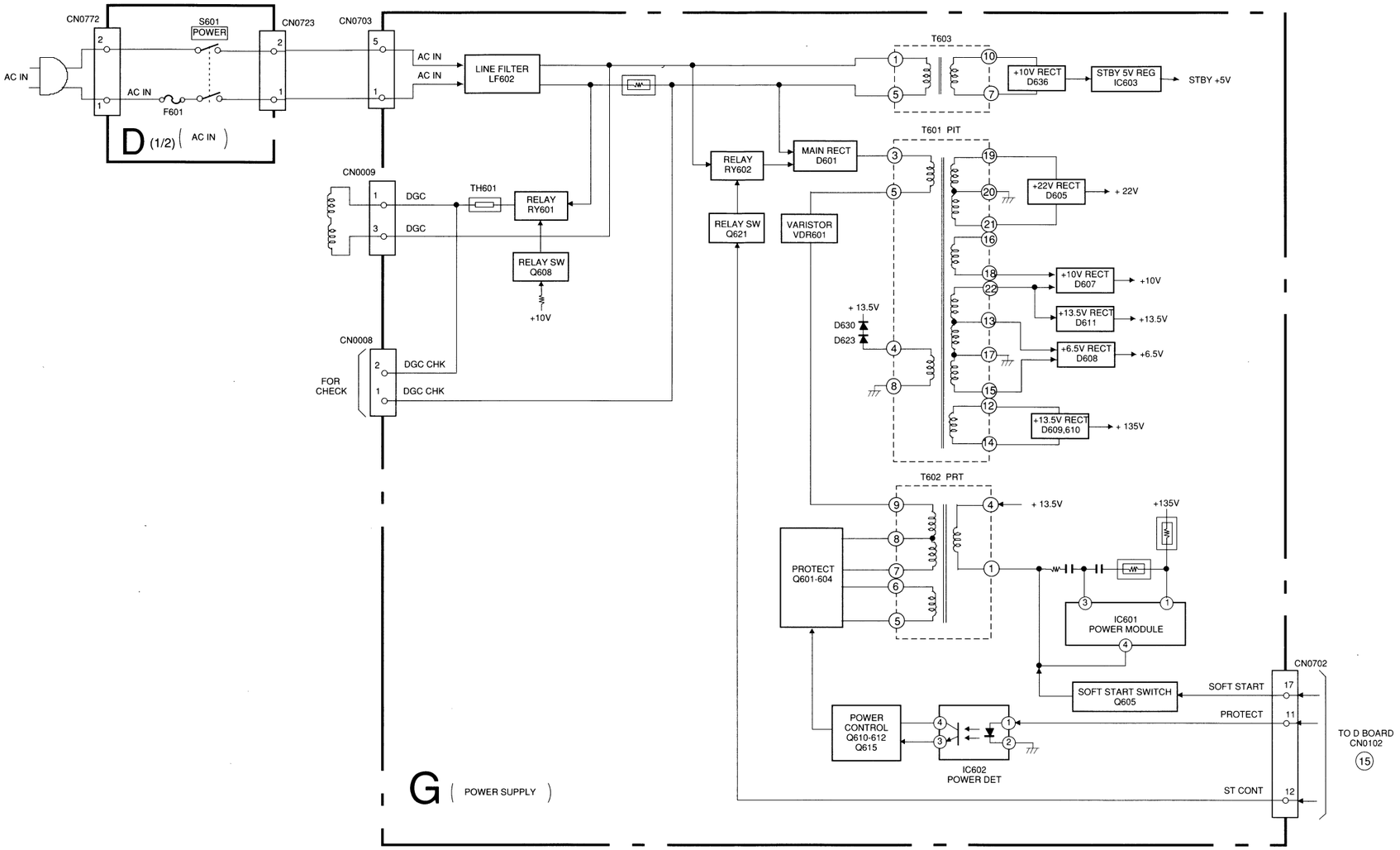


BLOCK DIAGRAM (6)




CN0103
SDA
SCL
TO T BOARD CN5002
8
CN0001
SDA
SCL
DISABLE
FOR SERVICE
TO B BOARD CN417
11
J900
HEADPHONES
CN0741
P.PLS L
P.PLS R
TO J1 BOARD CN552
12
SP L OUT
SP R OUT
CN 0747
SP PROT
TO K BOARD CN0273
13
CN0740
SURROUND
CENTRE
AU MUTE
TO K BOARD CN0271
14
J901
Y/C
VIDEO
L
R
IC603 +8V REG
REG
+8V
IC607 +5V REG
REG
on/off
+5V-2
CN0102
ST CONT
PROTECT
SOFT START
TO G BOARD CN0702
15
SOFT START SWITCH D633, Q616
CN0743
HD
H-PULSE
E/W
V+
V-
V-PROT
ABL
VM
TEXT BLK
H OUT DRIVE Q801
HDT T801
HDT T802
H DAMP D802,803
IC801 DI-MOD
PIN DRIVE Q803
D804 PIN PROTECT
PMT T803
T804 HLT
+135V
IC802 VERITICAL DEFLECTION BOOSTER
V OUT Q804
V+
V-
T805 FBT
D811 +200V RECT
+200V
+135V
H1
H2
D813 +15V RECT
+15V
-15V
D812 -15V RECT
DFT T806
FV
HV
TO C BOARD FV (J701)
TO PICTURE TUBE HV (V901)
17
DY1
H+
H-
V-
V+
DY
H DY
V DY
CN0004
CENTRE
RIGHT
LEFT
H CENTRE D805,806
CN0521
G2
H2
H1
TO C BOARD CN0421
16
Q.P OUT Q1610,1611
CN3133
Q.P+
Q.P-
VM
VM MUTE
CN1830
Q.P-
Q.P+
VM IN
VM MUTE
VM AMP Q1701, 1702, Q1704, 1706
VM MUTE Q1708
VM DRIVE Q1707,1710 Q1711,1712
VM OUT Q1703,1705
CN1701
Q.P-
QP +
QP
QP
VM
NECK ASSY
VM (VM AMP, Q.P)
IC2071 ROTATION AMP
+8V
CN0002
ROT (+)
ROT (-)
TO ROTATION COIL
D (2/2)
HV OUT, PIN OUT, ROTATION AMP, AUDIO/VIDEO IN, HEADPHONE JACK, AUDIO OUT JACK, SIRCS RECEIVER, FUNCTION SWITCH

BLOCK DIAGRAM (7)



KV-28WS4

5-2. CIRCU

5-3. SCHE

Note :

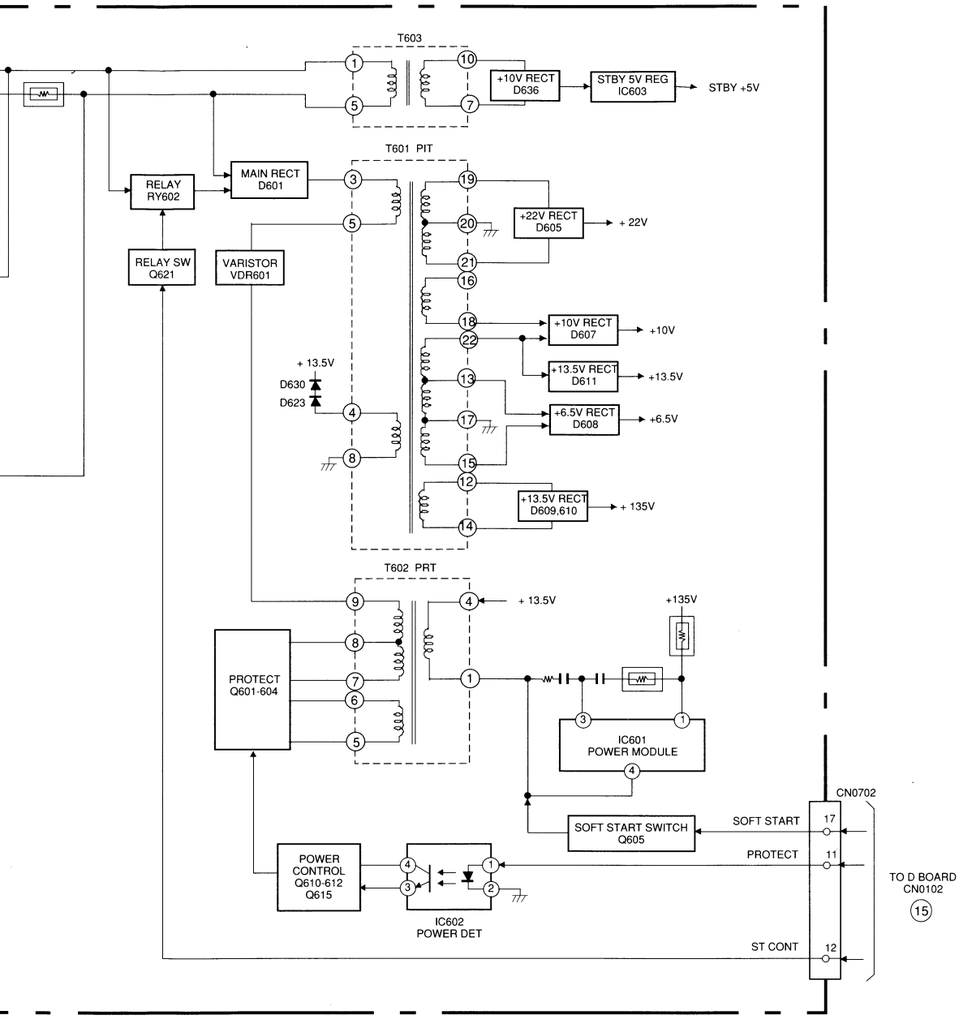
- All capac
  50WV or
  tantalums
- All resist
  k = 1000
- Indicatio
  electrical

Pitch : 5 m
Rating ele

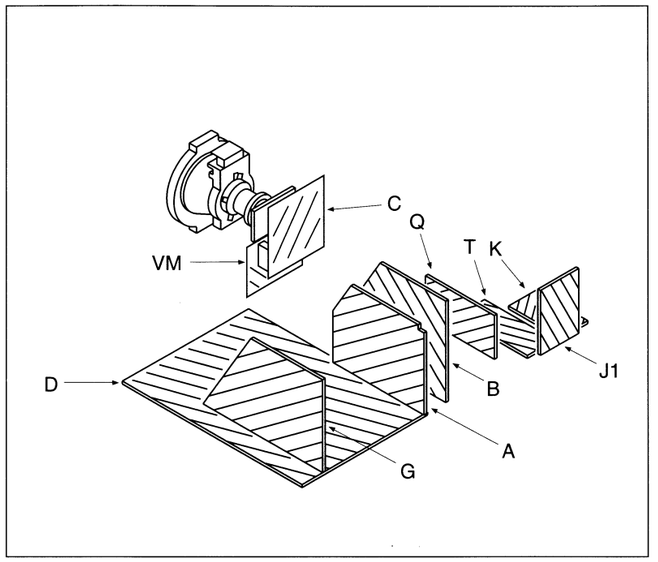
- All variab
  B, unless

Note : The c
a
part n

Note : Les c
marqu
Ne le
numer



5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm Rating electrical power ¼ W

- : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth - ground.
- ⏚ : earth - chassis.
- # : no mounted.

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part number specified.

Note : Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Reference information

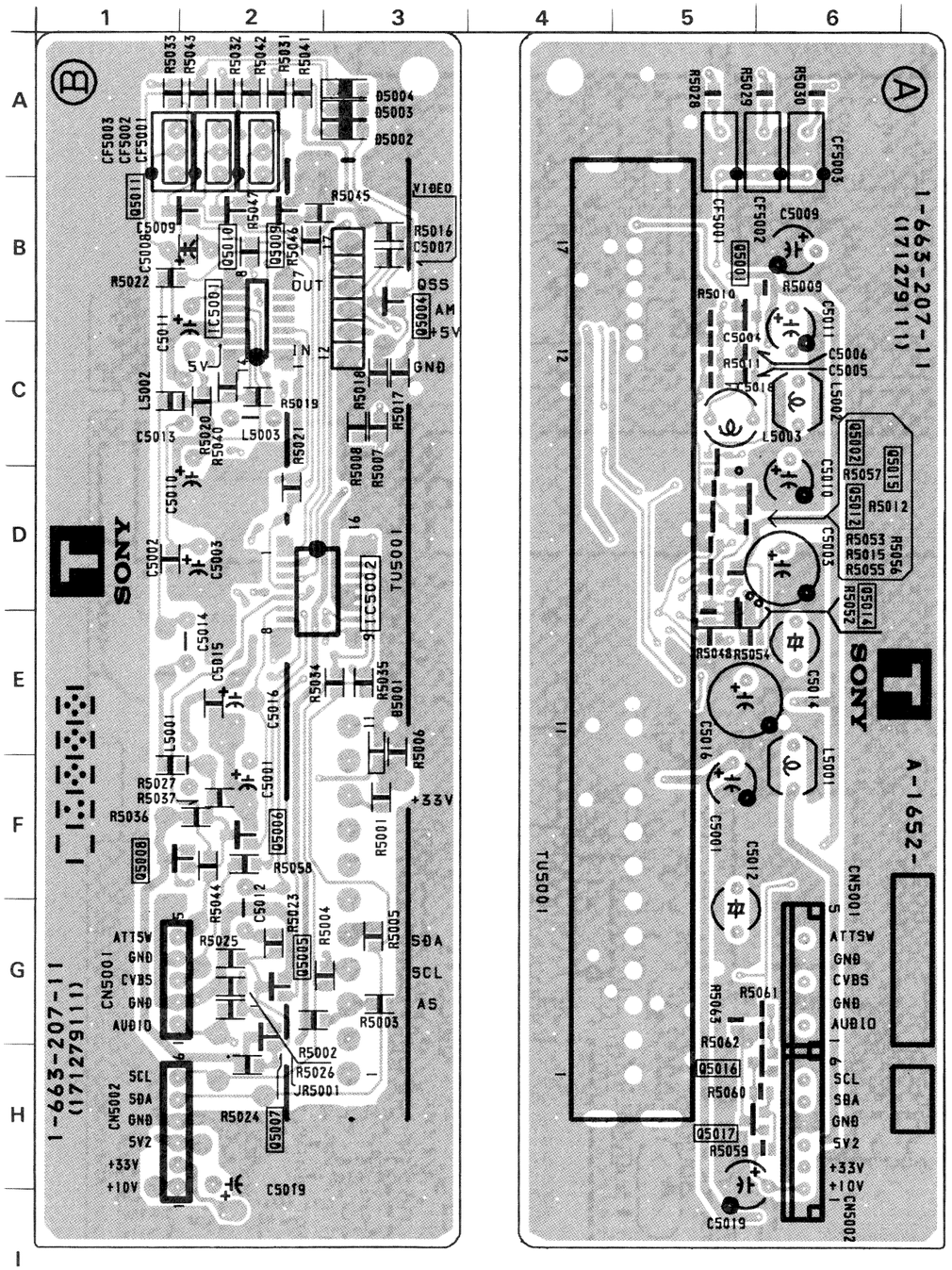
RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ⨳	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- ▬ : B+ bus.
- ➡ : signal path. (RF)

T [SUB TUNER]

T Board < Conductor Side >

T Board < Component Side >



T BOARD

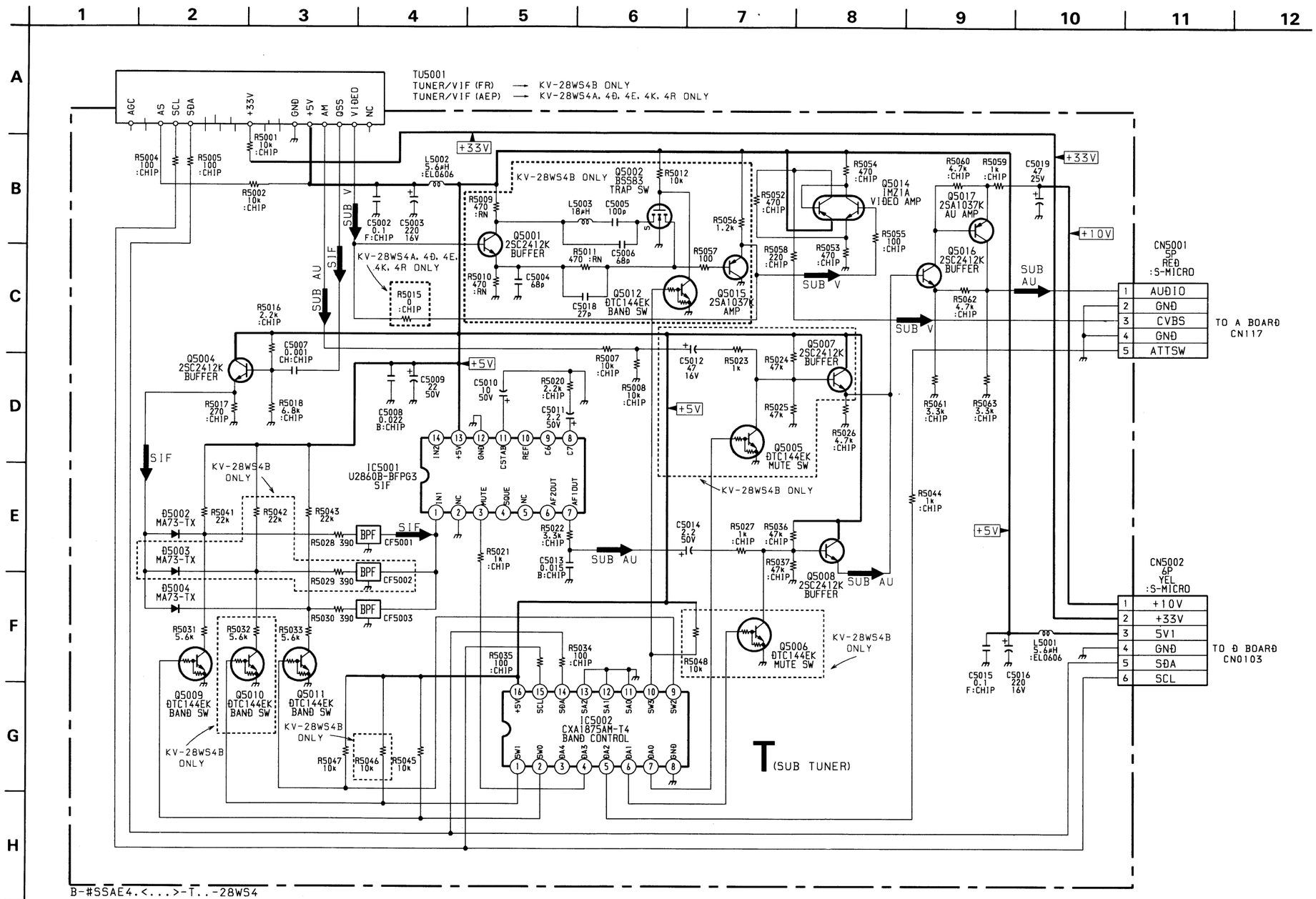
IC	
IC5001	B-2
IC5002	D-3
TANSISTOR	
Q5001	B-5
Q5002	C-6
Q5004	B-3
Q5005	G-2
Q5006	F-2
Q5007	H-2
Q5008	F-1
Q5009	B-2
Q5010	B-2
Q5011	B-1
Q5012	D-6
Q5014	D-6
Q5015	D-6
Q5016	H-5
Q5017	H-5
DIODE	
D5002	A-3
D5003	A-3
D5004	A-3

T BOARD IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC5001	1	1.8
	3	4.7
	4	3.4
	6-7	2.4
	8-10	2.1
	11	4.4
	13	4.9
	14	1.8
IC5002	2	4.0
	3	0.5
	4	4.7
	5	2.8
	6	0.5
	7	4.7
	9	0.1
	14	4.4
	15	4.0
	16	5.0

T BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q5008	2.4	5.0	1.8
Q5009	4.0	-	-
Q5011	0.1	4.8	-
Q5016	1.8	8.2	1.3
Q5017	8.2	2.3	9.0

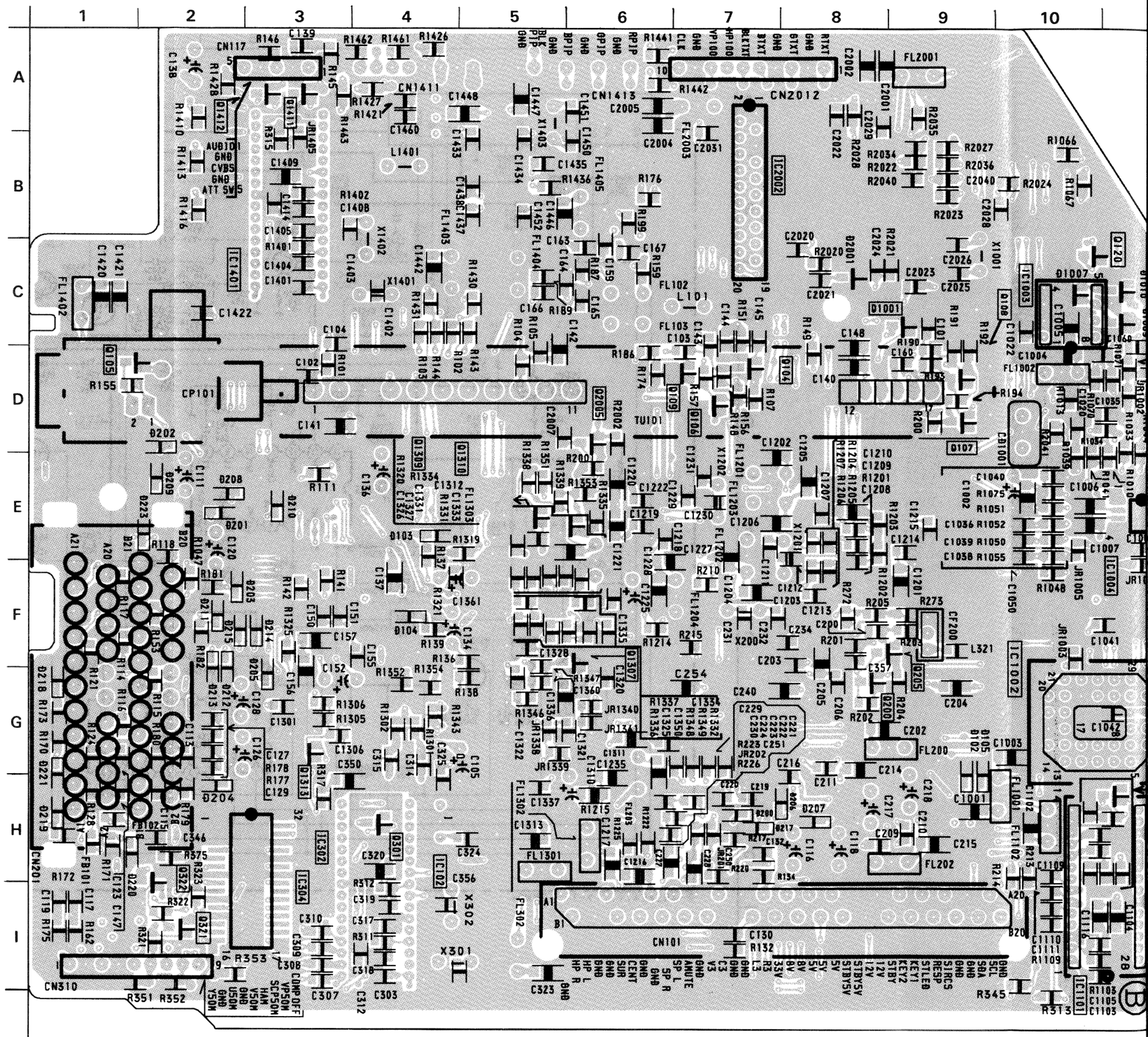

TU5001
TUNER/VIF (FR) → KV-28WS4B ONLY
TUNER/VIF (AEP) → KV-28WS4A, 4Đ, 4E, 4K, 4R ONLY
AGC
AS
SCL
SDA
+33V
GND
+5V
AM
QSS
VIDEO
NC
R5001 10k :CHIP
R5004 100 :CHIP
R5005 100 :CHIP
R5002 10k :CHIP
L5002 5.6µH :EL0606
+33V
SUB V
SIF
SUB AU
C5002 0.1 F:CHIP
C5003 220 16V
KV-28WS4A, 4Đ, 4E, 4K, 4R ONLY
R5015 0 :CHIP
KV-28WS4B ONLY
Q5002 BS583 TRAP SW
R5012 10k
R5009 470 :RN
L5003 18µH
C5005 100p
Q5001 2SC2412K BUFFER
R5011 470 :RN
C5006 68p
R5010 470 :RN
C5004 68p
R5056 1.2k
R5057 100
Q5012 ĐTC144EK BAND SW
C5018 27p
Q5015 2SA1037K AMP
R5052 470 :CHIP
R5054 470 :CHIP
Q5014 IMZ1A VIĐEO AMP
R5058 220 :CHIP
R5053 470 :CHIP
R5055 100 :CHIP
SUB V
R5060 4.7k :CHIP
R5059 1k :CHIP
C5019 47 25V
Q5017 2SA1037K AU AMP
+10V
Q5016 2SC2412K BUFFER
R5062 4.7k :CHIP
SUB AU
SUB V
CN5001 5P RED :S-MICRO
1 AUĐIO
2 GNĐ
3 CVBS
4 GNĐ
5 ATTSW
TO A BOARĐ CN117
R5016 2.2k :CHIP
Q5004 2SC2412K BUFFER
C5007 0.001 CH:CHIP
R5017 270 :CHIP
R5018 6.8k :CHIP
+5V
C5009 22 50V
C5008 0.022 B:CHIP
C5010 10 50V
R5020 2.2k :CHIP
C5011 2.2 50V
R5007 10k :CHIP
R5008 10k :CHIP
C5012 47 16V
R5023 1k
R5024 47k
Q5007 2SC2412K BUFFER
R5025 47k
Q5005 ĐTC144EK MUTE SW
R5026 4.7k :CHIP
KV-28WS4B ONLY
R5044 1k :CHIP
R5061 3.3k :CHIP
R5063 3.3k :CHIP
SIF
KV-28WS4B ONLY
IC5001 U2860B-BFPG3 SIF
IN2
+5V
GND
CSTAB
REF
C6
C7
IN1
NC
MUTE
SQUE
NC
AF2OUT
AF1OUT
Đ5002 MA73-TX
R5041 22k
R5042 22k
R5043 22k
R5028 390
BPF
CF5001
SIF
Đ5003 MA73-TX
R5029 390
BPF
CF5002
Đ5004 MA73-TX
R5030 390
BPF
CF5003
R5021 1k :CHIP
C5013 0.015 B:CHIP
R5022 3.3k :CHIP
SUB AU
C5014 2.2 50V
R5027 1k :CHIP
R5036 47k :CHIP
R5037 47k :CHIP
Q5008 2SC2412K BUFFER
SUB AU
+5V
CN5002 6P YEL :S-MICRO
1 +10V
2 +33V
3 5V1
4 GNĐ
5 SĐA
6 SCL
TO Đ BOARĐ CN0103
L5001 5.6µH :EL0606
C5015 0.1 F:CHIP
C5016 220 16V
R5031 5.6k
R5032 5.6k
R5033 5.6k
Q5009 ĐTC144EK BAND SW
Q5010 ĐTC144EK BAND SW
Q5011 ĐTC144EK BAND SW
KV-28WS4B ONLY
KV-28WS4B ONLY
R5047 10k
R5046 10k
R5045 10k
R5035 100 :CHIP
R5034 100 :CHIP
R5048 10k
Q5006 ĐTC144EK MUTE SW
KV-28WS4B ONLY
IC5002 CXA1875AM-T4 BAND CONTROL
+5V
SCL
SDA
SA2
SA1
SA0
SW3
SW2
SW1
SW0
DA4
DA3
DA2
DA1
DA0
GND
T (SUB TUNER)
B-#SSAE4.<...>-T..-28WS4

A AV INPUT/OUTPUT INTERFACE, DIGITAL COMB FILTER, COLOR DECODER,SOUND PROCESSOR, DOLBY NOISE REDUCTION, MICRO CONTROLLER, MEGA TEXT

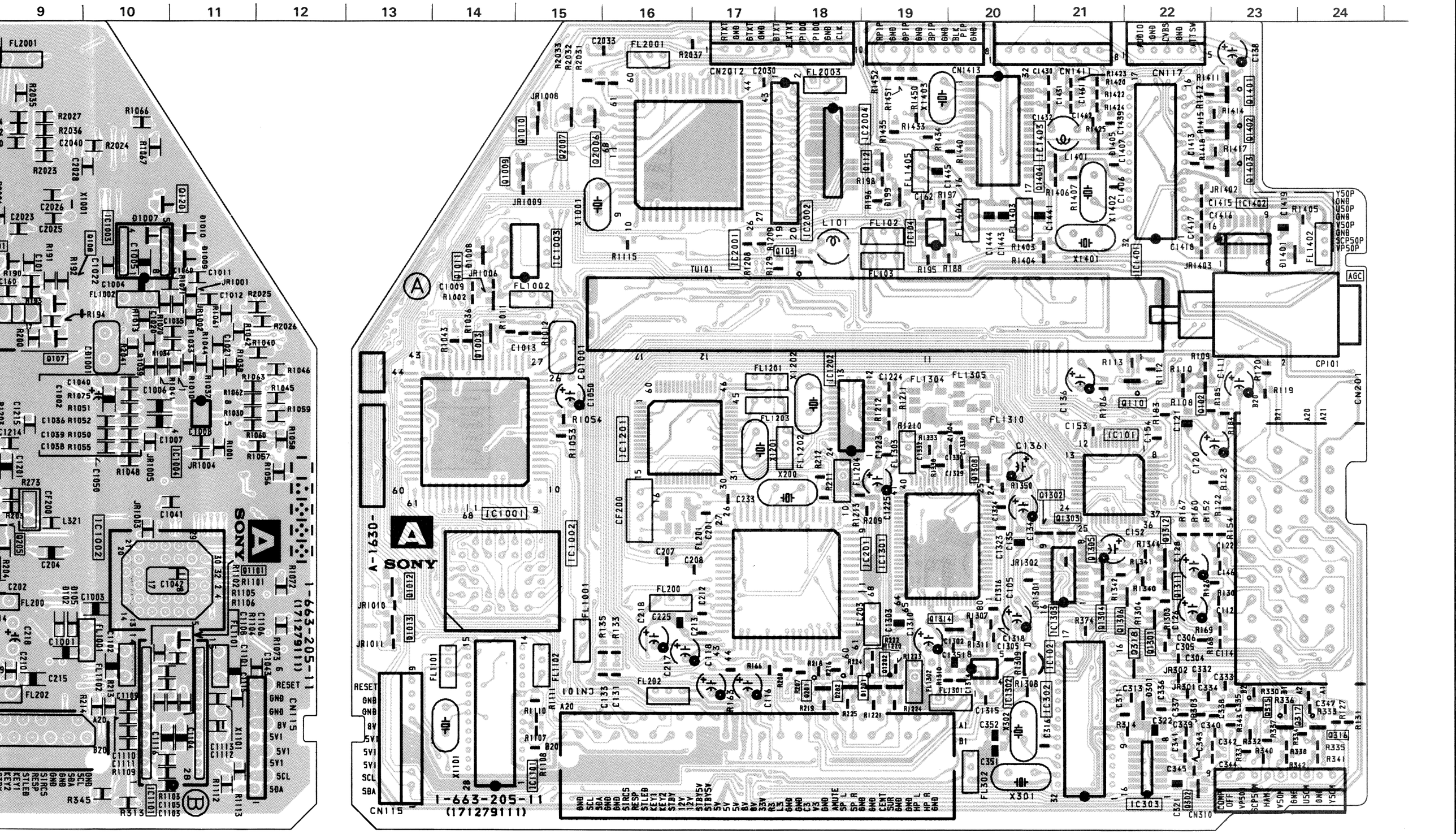
A BOARD

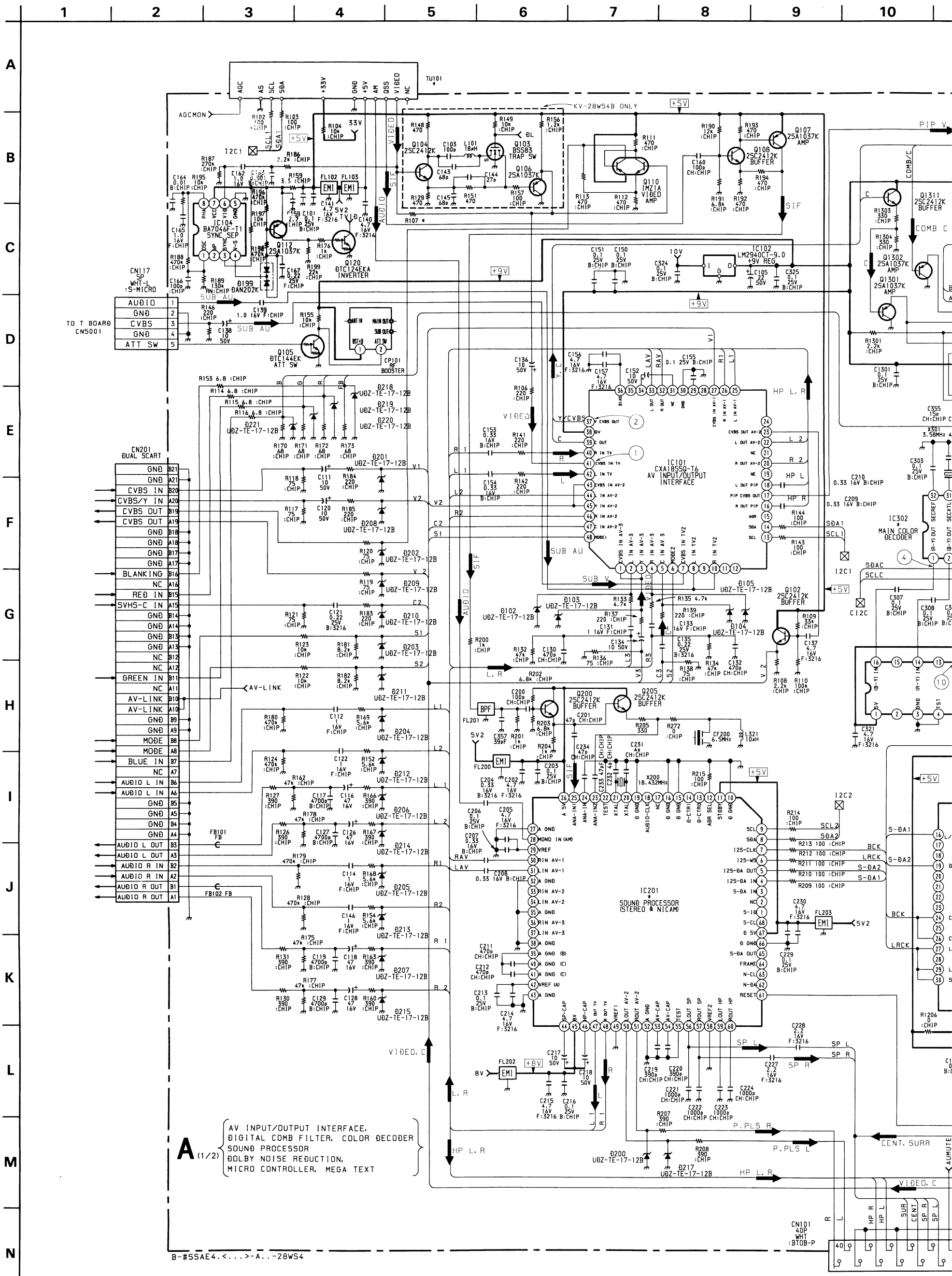
IC		Q1001	C-9	D208	E-2
IC101	E-22	Q1101	G-11	D209	E-2
IC102	H-4	Q1201	H-19	D210	E-3
IC104	C-19	Q1202	H-19	D211	F-2
IC201	G-19	Q1301	H-22	D212	G-2
IC302	H-3	Q1302	F-21	D213	G-2
IC303	I-22	Q1303	F-21	D214	F-3
IC304	H-3	Q1304	G-21	D215	F-2
IC1001	F-14	Q1305	G-21	D217	H-7
IC1002	G-10	Q1306	G-22	D218	G-1
IC1003	C-10	Q1307	F-6	D219	H-1
IC1004	E-11	Q1308	F-20	D220	H-1
IC1101	I-10	Q1309	D-4	D221	G-1
IC1201	E-16	Q1310	D-5	D223	E-2
IC1202	E-18	Q1311	G-22	D301	H-22
IC1301	G-19	Q1312	F-22	D1007	C-10
IC1302	H-20	Q1313	G-3	D1008	C-14
IC1303	G-21	Q1314	G-20	D1009	C-11
IC1401	C-2	Q1401	A-23	D1010	C-11
IC1402	C-23	Q1402	B-23	D1401	C-23
IC2001	C-17	Q1403	B-23	D2001	C-8
IC2004	B-19	Q1404	B-21		
TRANSISTOR		Q1411	A-3		
Q102	E-23	Q1412	A-2		
Q103	C-18	Q2005	D-6		
Q104	D-8	Q2006	B-15		
Q105	D-1	Q2007	B-15		
Q106	D-7	DIODE			
Q107	D-9	D102	G-9		
Q108	C-10	D103	E-4		
Q110	E-22	D104	F-4		
Q112	B-19	D105	G-9		
Q120	C-11	D199	C-19		
Q200	G-8	D200	H-7		
Q205	F-9	D201	E-2		
Q301	H-4	D202	D-2		
Q302	I-22	D203	F-3		
Q315	H-23	D204	H-2		
Q316	I-24	D205	F-3		
Q317	I-24	D206	H-8		
Q318	H-22	D207	H-8		

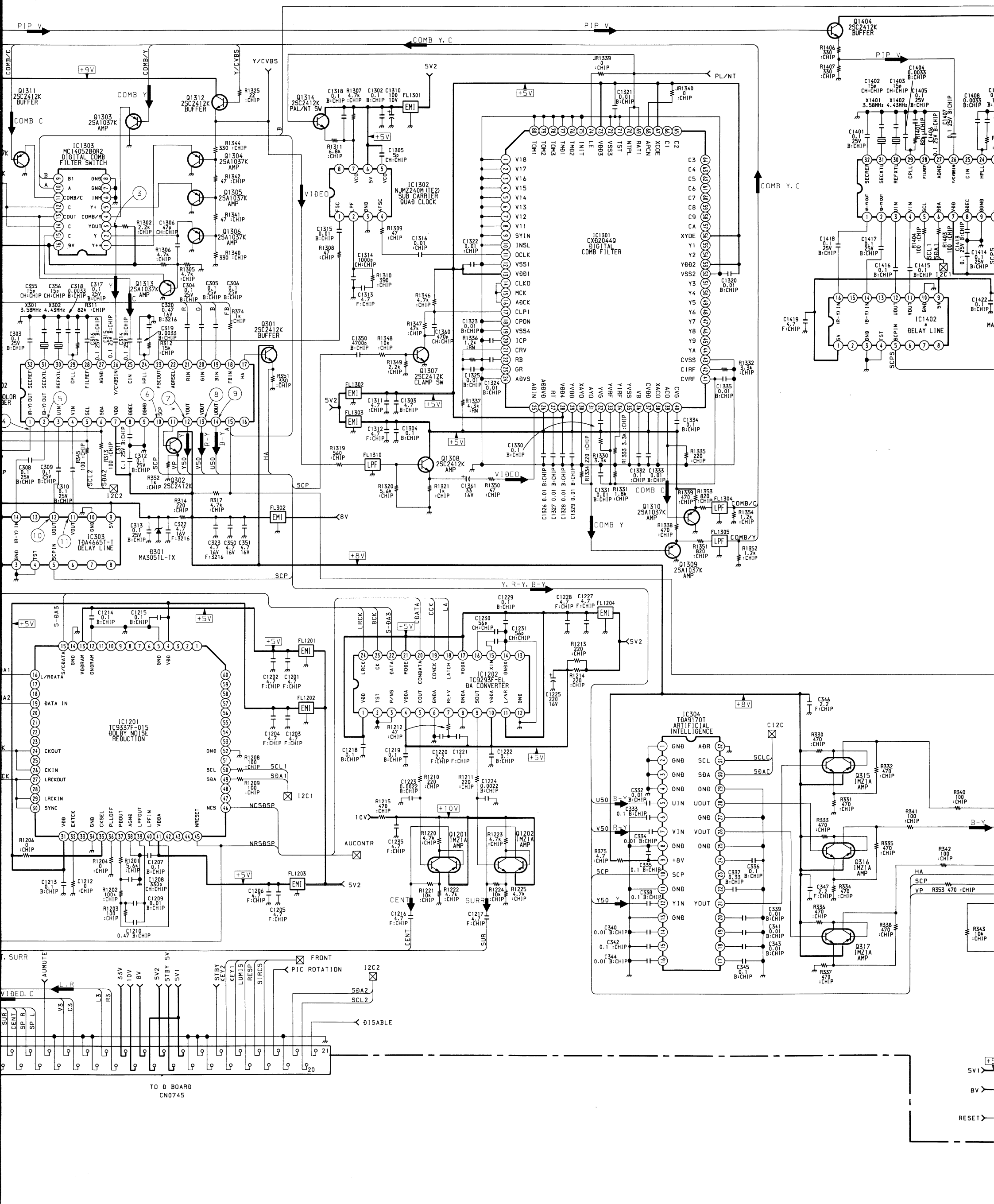
A Board < Conductor Side >

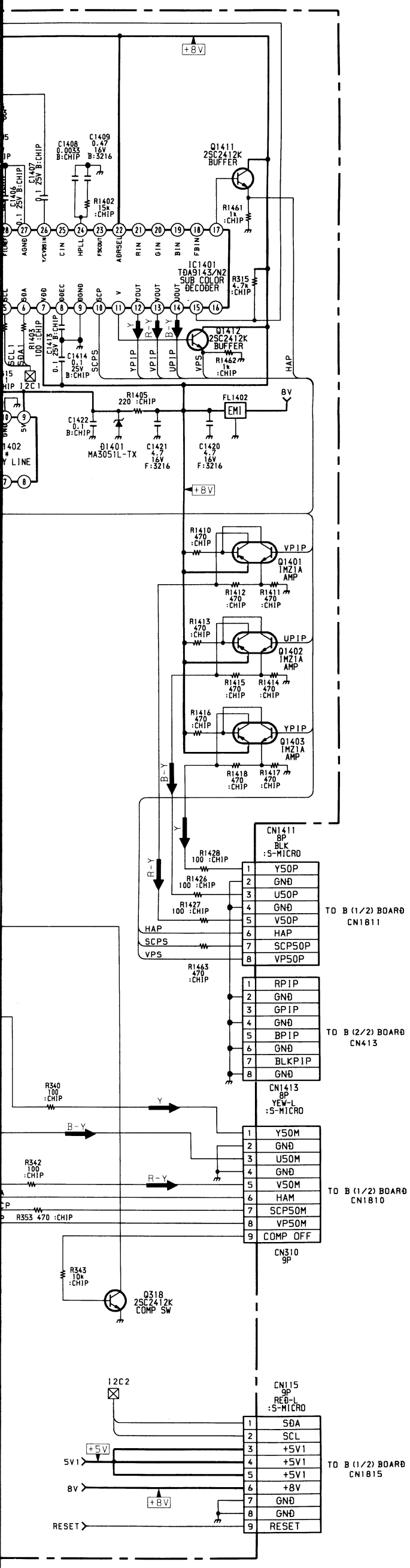

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
CN117
R146
C139
R1462
R1461
R1426
C138
R1428
Q1412
Q1411
R1427
R1421
CN1411
C1448
R1410
R1413
R1416
JR1405
R315
R1443
C1460
L1401
C1409
C1433
C1434
C1447
X1403
C1451
C1450
CN1413
C2005
FL2001
R1442
CN2012
C2002
C2001
C2029
C2022
R2028
R2035
R2034
R2022
R2040
R2027
R2036
C2040
R2024
R1066
R1067
C2028
C2004
C2031
FL2003
FL1405
C1435
R1436
R176
R199
C1446
C1452
FL1404
C163
C164
C159
R187
C165
R159
R167
FL102
L101
C2020
R2020
C2021
B2001
R2021
C2024
C2023
C2026
C2025
X1001
Q120
D1007
IC1003
C1005
R108
C1022
C1004
FL1002
D1001
R191
C101
R192
R190
C160
R195
C148
C140
R149
R194
R200
C1040
C1007
JR1001
IC1004
R1048
C1050
C1042
JR1003
IC1002
C1041
L321
C1043
C1003
C1001
C1102
FL1001
FL1102
R213
C1105
C1116
C1104
C1110
C1111
R1109
C1103
R1103
C1105
C1103
IC1101
R313
R345
C1006
R1075
R1051
R1052
R1050
R1055
C1036
C1039
C1038
C1040
C1002
C1035
R1033
R1054
R1061
R1074
C1020
C1021
C1022
C1107
C1108
C1101
C1106
C1109
C1112
C1113
C1114
C1115
C1117
C1118
C1119
C1120
C1121
C1122
C1123
C1124
C1125
C1126
C1127
C1128
C1129
C1130
C1131
C1132
C1133
C1134
C1135
C1136
C1137
C1138
C1139
C1140
C1141
C1142
C1143
C1144
C1145
C1146
C1147
C1148
C1149
C1150
C1151
C1152
C1153
C1154
C1155
C1156

A Board < Component Side >




1 2 3 4 5 6 7 8 9 10
A B C D E F G H I J K L M N O
TU101
AGC AS SCL SDA +33V GND +5V AM QSS VIDEO NC
AGCMON
KV-28WS4B ONLY
IC104 BA7046F-T1 SYNC SEP
Q112 2SA1037K
Q120 DTC124EKA INVERTER
Q104 2SC2412K
Q103 BSS83 TRAP SW
Q106 2SA1037K
Q110 IMZ1A VIDEO AMP
Q107 2SA1037K AMP
Q108 2SC2412K BUFFER
IC102 LM2940CT-9.0 +9V REG
Q1311 2SC2412K BUFFER
Q1302 2SA1037K AMP
Q1301 2SA1037K AMP
CN117 5P WHT-L :S-MICRO
TO T BOARD CN5001
AUDIO GND CVBS GND ATT SW
Q105 DTC144EK ATT SW
CP101 RF BOOSTER
CN201 DUAL SCART
IC101 CXA1855Q-T6 AV INPUT/OUTPUT INTERFACE
IC201 SOUND PROCESSOR (STEREO & NICAM)
IC302 * MAIN COLOR DECODER
Q102 2SC2412K BUFFER
Q200 2SC2412K BUFFER
Q205 2SC2412K BUFFER
X200 18.432MHz
X301 3.58MHz
CF200 6.5MHz
D105 UDZ-TE-17-12B
D103 UDZ-TE-17-12B
D104 UDZ-TE-17-12B
D102 UDZ-TE-17-12B
D200 UDZ-TE-17-12B
D217 UDZ-TE-17-12B
D218 UDZ-TE-17-12B
D219 UDZ-TE-17-12B
D220 UDZ-TE-17-12B
D221 UDZ-TE-17-12B
D201 UDZ-TE-17-12B
D208 UDZ-TE-17-12B
D202 UDZ-TE-17-12B
D209 UDZ-TE-17-12B
D210 UDZ-TE-17-12B
D203 UDZ-TE-17-12B
D211 UDZ-TE-17-12B
D204 UDZ-TE-17-12B
D212 UDZ-TE-17-12B
D206 UDZ-TE-17-12B
D214 UDZ-TE-17-12B
D205 UDZ-TE-17-12B
D213 UDZ-TE-17-12B
D207 UDZ-TE-17-12B
D215 UDZ-TE-17-12B
D199 DAN202K
FL102 FL103 FL200 FL201 FL202 FL203
FB101 FB
FB102 FB
I2C1
I2C2
SDA1 SCL1
SDAC SCLC
SUB AU
SUB V
SIF
AUDIO
VIDEO
VIDEO. C
HP L, R
P. PLS L, R
CENT. SURR
AV-LINK
AUMUTE
A (1/2) AV INPUT/OUTPUT INTERFACE. DIGITAL COMB FILTER. COLOR DECODER SOUND PROCESSOR DOLBY NOISE REDUCTION. MICRO CONTROLLER. MEGA TEXT
CN101 40P WHT :BTOB-P
B-#SSAE4.<...>-A..-28WS4

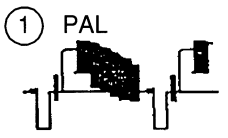
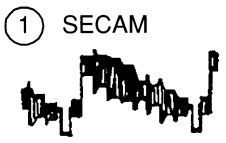
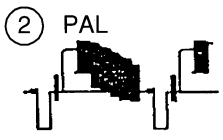
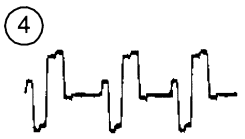
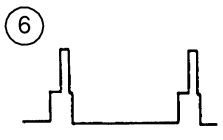
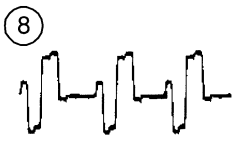
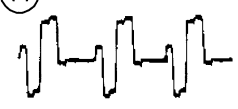

PIP Y
COMB Y, C
Y/CVBS
COMB/C
COMB/Y
+9V
+5V
+8V
+10V
5V2
8V
Q1311 2SC2412K BUFFER
Q1312 2SC2412K BUFFER
Q1313 2SA1037K AMP
Q1303 2SA1037K AMP
Q1304 2SA1037K AMP
Q1305 2SA1037K AMP
Q1306 2SA1037K AMP
Q1340 2SA1037K AMP
IC1303 MC14052B0R2 DIGITAL COMB FILTER SWITCH
IC1303 TDA4665T-T DELAY LINE
IC1302 NJMZ240M(TE2) SUB CARRIER QUAD CLOCK
IC1301 CX02044Q DIGITAL COMB FILTER
Q1314 2SC2412K PAL/NT SW
Q1307 2SC2412K CLAMP SW
Q1308 2SC2412K AMP
Q1310 2SA1037K AMP
Q1309 2SA1037K AMP
Q1404 2SC2412K BUFFER
Q301 2SC2412K BUFFER
Q302 2SC2412K
Q1201 IMZ1A AMP
Q1202 IMZ1A AMP
Q315 IMZ1A AMP
Q316 IMZ1A AMP
Q317 IMZ1A AMP
IC1402 DELAY LINE
IC1201 TC9337F-015 DOLBY NOISE REDUCTION
IC1202 TC9293F-EL D/A CONVERTER
IC304 TDA9170T ARTIFICIAL INTELLIGENCE
D301 MA3051L-TX
PL/NT
VIDEO
SCP
HA
Y, R-Y, B-Y
FRONT
PIC ROTATION
DISABLE
AUCONTR
AUMUTE
TO D BOARD
CN0745



A (1/2) BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q102	1.9	4.7	1.3
Q105	0.08	4.5	0.08
Q107	4.4	1.7	5.0
Q108	1.8	4.4	1.2
Q112	4.3	4.9	5.0
Q120	4.6	0.1	0.1
Q301	0.5	8.0	0.4
Q302	-	8.0	0.3
Q318	0.1	5.2	0.1
Q1201	8.6	5.0	9.2
Q1202	0.7	5.0	9.2
Q1301	1.9	-	0.2
Q1302	-	-	0.6
Q1303	0.8	-	1.5
Q1304	2.2	-	0.1
Q1305	2.0	-	0.1
Q1306	1.7	-	-
Q1307	-	3.4	0.1
Q1308	3.5	4.7	2.9
Q1309	0.9	0.1	1.6
Q1310	1.0	0.1	1.6
Q1311	4.5	9.0	3.9
Q1312	4.5	9.0	-
Q1313	4.6	0.7	0.1
Q1314	4.8	4.7	4.3
Q1404	4.5	7.8	3.8
Q1411	0.5	8.0	0.6
Q1412	0.1	8.0	0.1
Q1201	2.6	8.6	2.1
Q1202	2.6	8.6	2.1

WAVEFORMS A BOARD

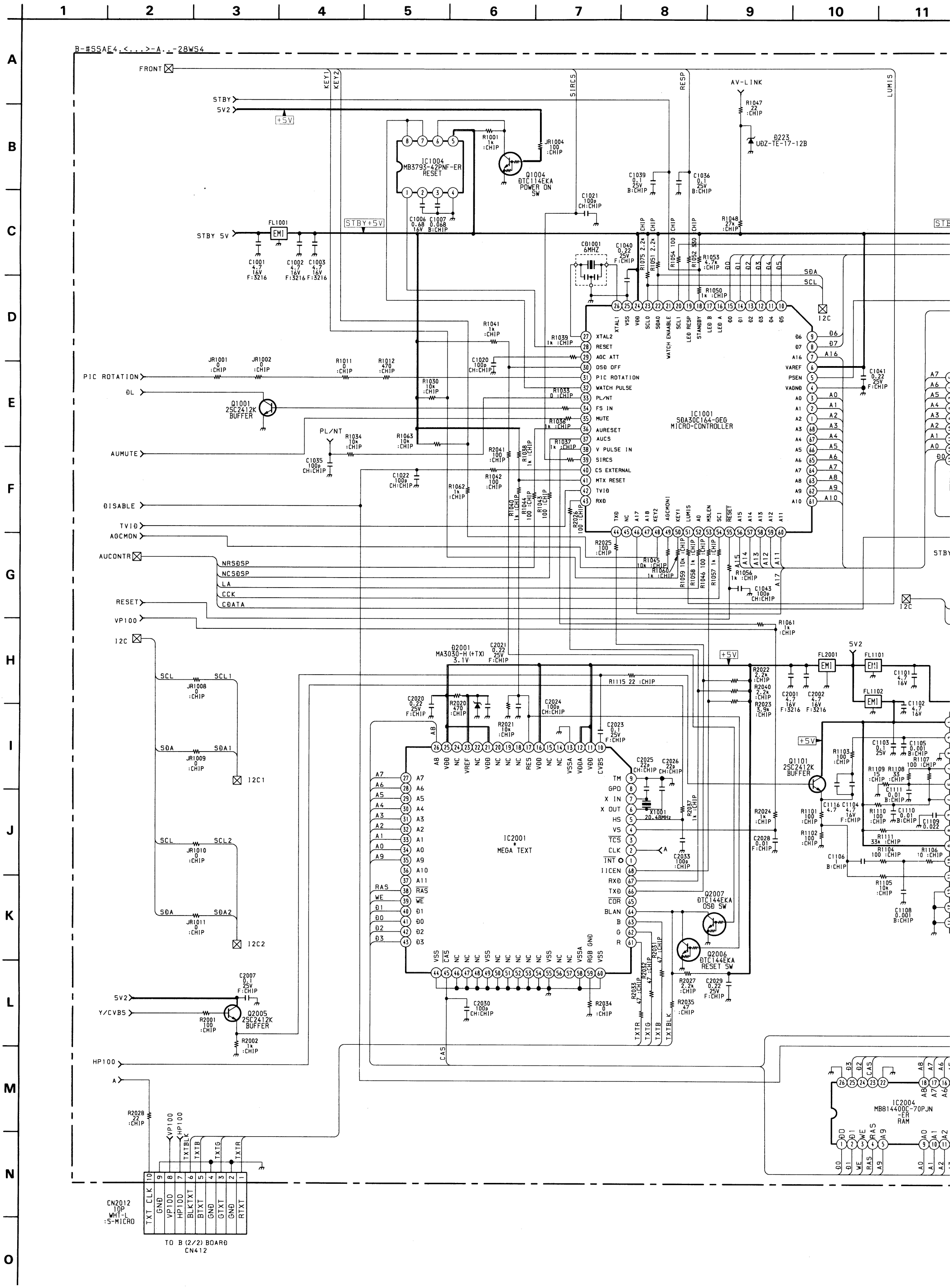
① PAL  1.0 Vp-p (H)	① SECAM  1.0 Vp-p (H)	② PAL  2.0 Vp-p (H)
② SECAM 2.0 Vp-p (H)	③ PAL 1.0 Vp-p (H)	③ SECAM 1.2 Vp-p (H)
④  0.6 Vp-p (H)	⑤ 0.7 Vp-p (H)	⑥  4.5 Vp-p (H)
⑦ 1.0 Vp-p (H)	⑧  1.0 Vp-p (H)	⑨ 1.4 Vp-p (H)
⑩ 1.5 Vp-p (H)	⑪  1.0 Vp-p (H)	

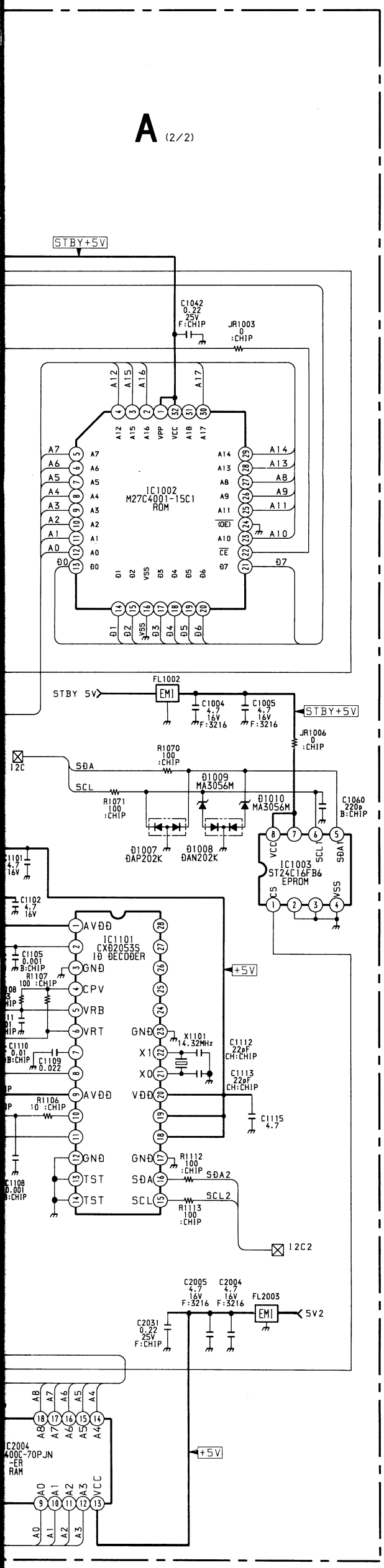
A (1/2) BOARD IC VOLTAGE TABLE

IC Voltage Table					
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC201	4	0.5	IC1201	4	4.7
	5-6	4.7		13	4.7
	7	2.4		31	4.7
	8-9	4.7		35	4.7
	20	2.4		37	2.7
	24	4.4		39	2.2
	25	8.8		40	2.7
	26	4.4		41	4.7
	28	3.8		45	4.8
	29	2.7		29	2.7
	30-31	3.8		30-31	3.8
	39-42	3.8		39-42	3.8
	44	6.2		44	6.2
	45	8.0		45	8.0
	46	7.0	IC1303	1	5.0
	47-48	3.8		5	0.6
	50-51	3.7		11-12	3.0
	53-54	3.8		14	1.4
	56-57	1.2		16	1.2
	61	4.8	IC1401	1-2	2.0
IC302	1-2	2.0		3-4	2.4
	3-4	2.4		5	3.5
	5	3.0		6	4.0
	6	4.0		7	7.8
	7	8.0		8	5.0
	8	5.0		10	0.8
	10	0.5		12	2.4
	12	3.2		13-14	2.6
	13-14	2.6		15	8.0
	15	8.0		17	0.3
	17	0.3		22	7.8
	19	1.6		24	3.6
	21	1.0		26	3.3
	23-24	4.0		28	3.5
	26	3.7		29	4.3
	28	3.5		30	2.6
	29	5.0		31	2.6
	30	2.5		32	3.8
	31	2.5			
	32	2.0			

A BOARD * MARK

Model / Ref. No.	28WS4A	28WS4B	28WS4D	28WS4E	28WS4K	28WS4R
IC201	MSP3400C-PP-C6-T-ND	MSP3410B-PS-F7-T-ND	MSP3400C-PP-C6-T-ND	MSP3410B-PS-F7-T-ND	MSP3400C-PP-C6-T-ND	MSP3400C-PP-C6-T-ND
IC302	TDA9144/N2	TDA9143/N2	TDA9144/N2	TDA9144/N2	TDA9144/N2	TDA9144/N2
IC1402	TDA4665T-T	—	TDA4665T-T	TDA4665T-T	TDA4665T-T	TDA4665T-T
IC2001	SDA5275	SDA5275	SDA5275	SDA5273P-C26-GEG	SDA5275	SDA5275
R107	0:CHIP	—	0:CHIP	0:CHIP	0:CHIP	0:CHIP
TU101	TUVIF (AEP)	TUVIF (FR)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (AEP)	TUVIF (AEP)


B-#SSAE4.<...>-A..-28WS4
FRONT
KEY1
KEY2
SIRCS
RESP
LUMIS
AV-LINK
STBY
5V2
+5V
STBY 5V
STBY+5V
FL1001
EMI
IC1004
MB3793-42PNF-ER
RESET
Q1004
ĐTC114EKA
POWER ON
SW
R1001
1k
:CHIP
JR1004
100
:CHIP
R1047
22
:CHIP
Đ223
UĐZ-TE-17-12B
C1039
0.1
25V
B:CHIP
C1036
0.1
25V
B:CHIP
C1021
100p
CH:CHIP
R1048
27k
:CHIP
C1001
4.7
16V
F:3216
C1002
4.7
16V
F:3216
C1003
4.7
16V
F:3216
C1006
0.68
16V
B:CHIP
C1007
0.068
B:CHIP
CĐ1001
6MHZ
C1040
0.22
25V
F:CHIP
R1075 2.2k
R1051 2.2k
R1054 100
R1052 330
R1053
4.7k
:CHIP
R1050
1k :CHIP
SĐA
SCL
I2C
Đ0
Đ1
Đ2
Đ3
Đ4
Đ5
Đ6
Đ7
A16
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
R1041
1k
:CHIP
R1039
1k :CHIP
C1020
100p
CH:CHIP
JR1001
0
:CHIP
JR1002
0
:CHIP
R1011
0
:CHIP
R1012
470
:CHIP
R1030
10k
:CHIP
R1033
0 :CHIP
R1036
1k :CHIP
R1037
1k :CHIP
R1063
10k
:CHIP
R1034
10k
:CHIP
R2041
100
:CHIP
R1038
1k :CHIP
R1042
100
:CHIP
R1062
1k
:CHIP
R1040
1k :CHIP
R1044
100 :CHIP
R1043
100 :CHIP
R2026
100 :CHIP
R2025
100
:CHIP
C1035
100p
CH:CHIP
C1022
100p
CH:CHIP
Q1001
2SC2412K
BUFFER
PIC ROTATION
ĐL
PL/NT
AUMUTE
ĐISABLE
TVIĐ
AGCMON
AUCONTR
NRSĐSP
NCSĐSP
LA
CCK
CĐATA
RESET
VP100
I2C
IC1001
SĐA30C164-GEG
MICRO-CONTROLLER
XTAL1
VSS
VĐĐ
SCL0
SĐA0
WATCH ENABLE
SCL1
LED RESP
STANDBY
LED B
LED A
ĐD
ĐI
ĐC
ĐB
ĐA
ĐĐ
XTAL2
RESET
AGC ATT
OSĐ OFF
PIC ROTATION
WATCH PULSE
PL/NT
FS IN
MUTE
AURESET
AUCS
V PULSE IN
SIRCS
CS EXTERNAL
MTX RESET
TVIĐ
RXĐ
TXĐ
NC
A17
A18
KEY2
AGCMONI
KEY1
LUMIS
A0
MĐLEN
SC1
RESET
A15
A14
A13
A12
A11
R1045
10k :CHIP
R1060
1k :CHIP
R1059 10k
R1058 1k
R1046 100
R1057 1k
R1056
1k :CHIP
C1043
100p
CH:CHIP
R1061
1k
:CHIP
ĐC
ĐB
ĐA
ĐĐ
ĐD
ĐI



A (2/2) BOARD IC VOLTAGE TABLE

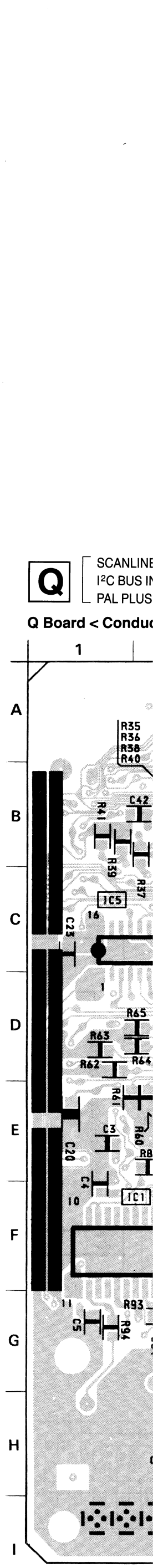
IC Voltage Table					
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC101	1-5	4.6	1101	1	4.8
	7-8	4.6		2	1.1
	10	4.6		4	0.9
	17	4.6		5	0.3
	23	4.6		6-7	2.4
	29	4.6		8	1.4
	31	4.6		9	4.7
	34	4.6		10	1.7
	36	4.6		11	1.5
	38	9.0		16	4.0
	40-47	4.6		18-20	4.7
IC1001	5	2.4		21	2.5
	6	4.8		22	2.3
	19	3.6	2001	2	0.4
	20	0.1		5	0.3
	24	4.8		6-7	1.6
	26	2.1		8	4.0
	27	2.3		10	1.0
	28	4.6		11-12	4.7
	30	0.1		16	4.7
	31-32	2.4		21	4.7
	33	4.8		23	2.9
	36	4.1		25	4.7
	38	0.1		66	4.7
	39	0.6		68	4.7
	40	4.8			
	41	0.1			
	42	4.8			
	43	4.4			
	44	4.1			
	48	4.8			
	49	2.2			
	50	4.8			
	52	4.8			
	54	4.8			

A (2/2) BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q1001	0.1	0.7	0.1
Q1004	0.1	0.7	-
Q1101	3.3	5.0	2.6

Q BOARD

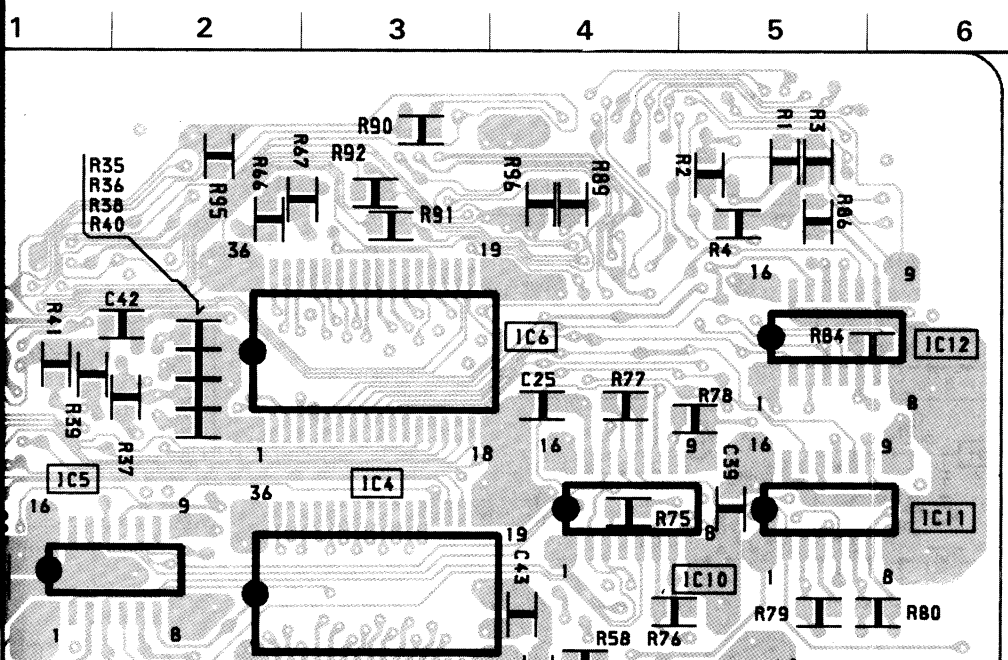
IC	
IC1	F-2
IC2	F-12
IC3	C-12
IC4	C-3
IC5	C-1
IC6	B-4
IC7	F-7
IC8	H-5
IC9	G-3
IC10	C-5
IC11	C-6
IC12	B-6
TRANSISTOR	
Q1	G-4

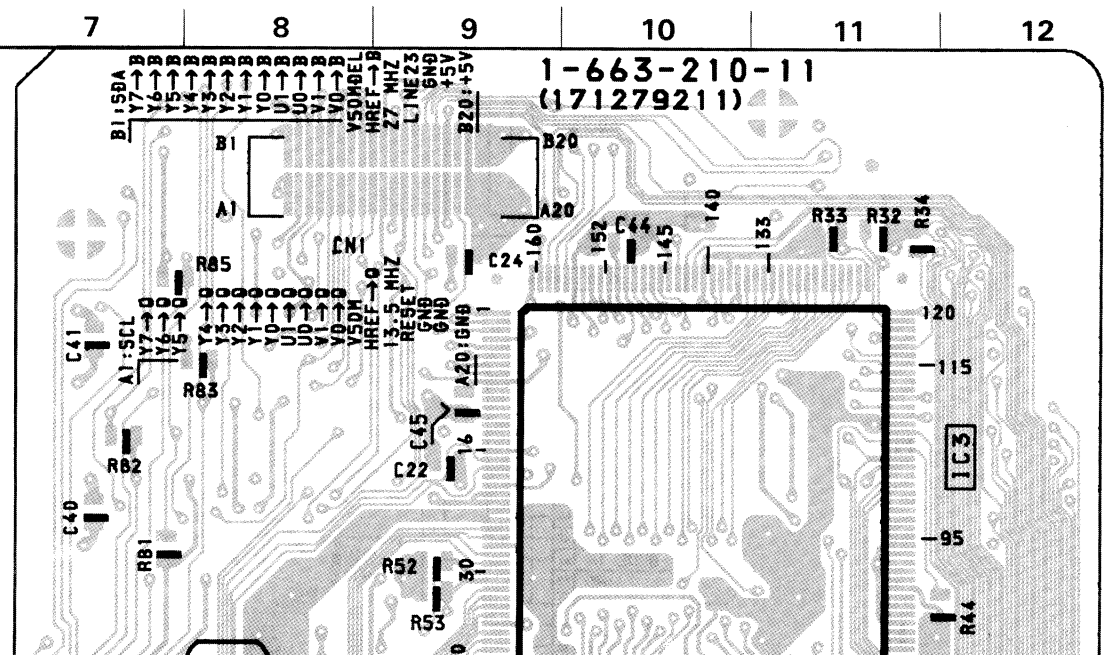


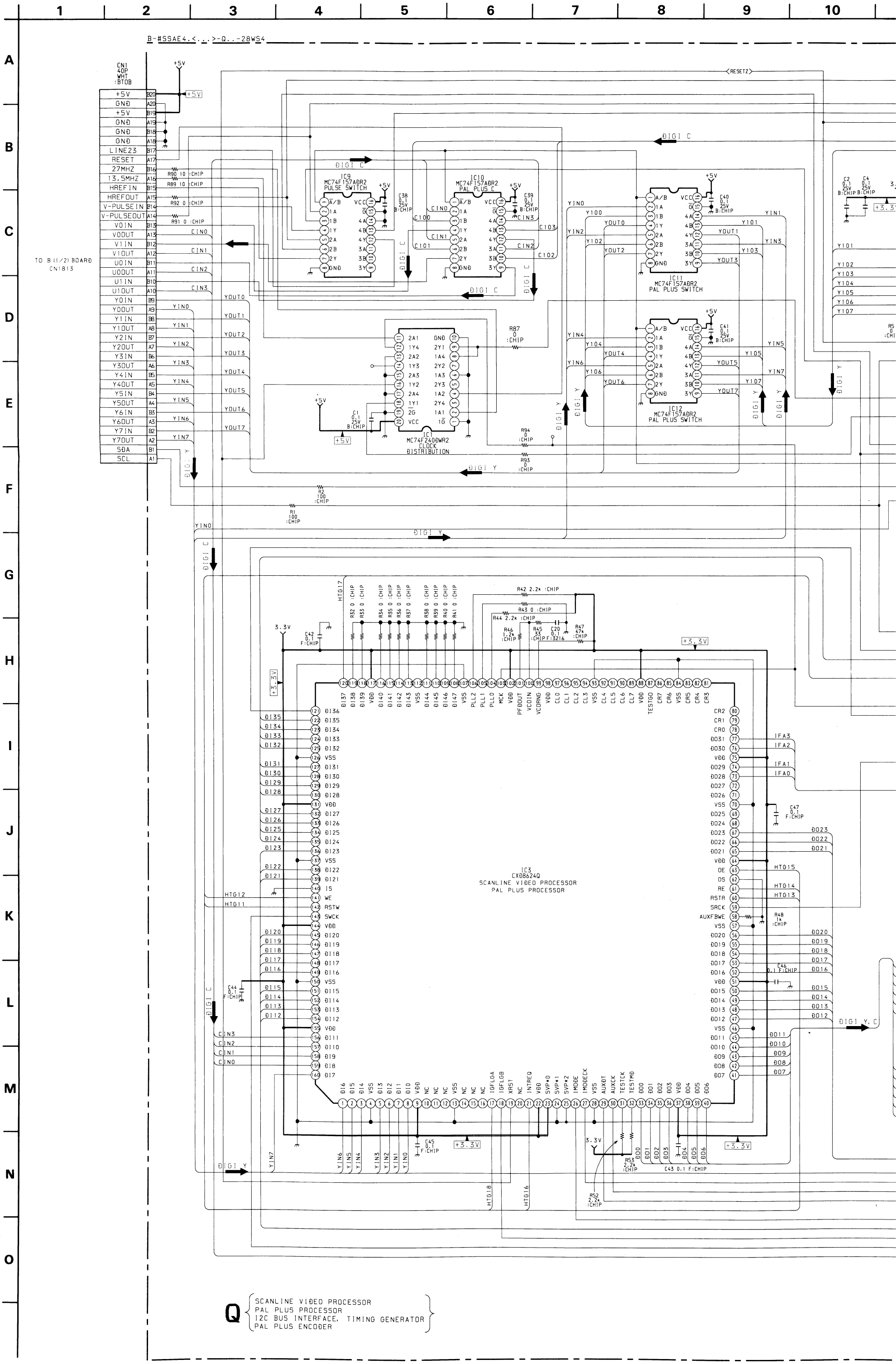
SCANLINE VIDEO PROCESSOR, PAL PLUS PROCESSOR,
I²C BUS INTERFACE, TIMING GENERATOR,
PAL PLUS ENCODER

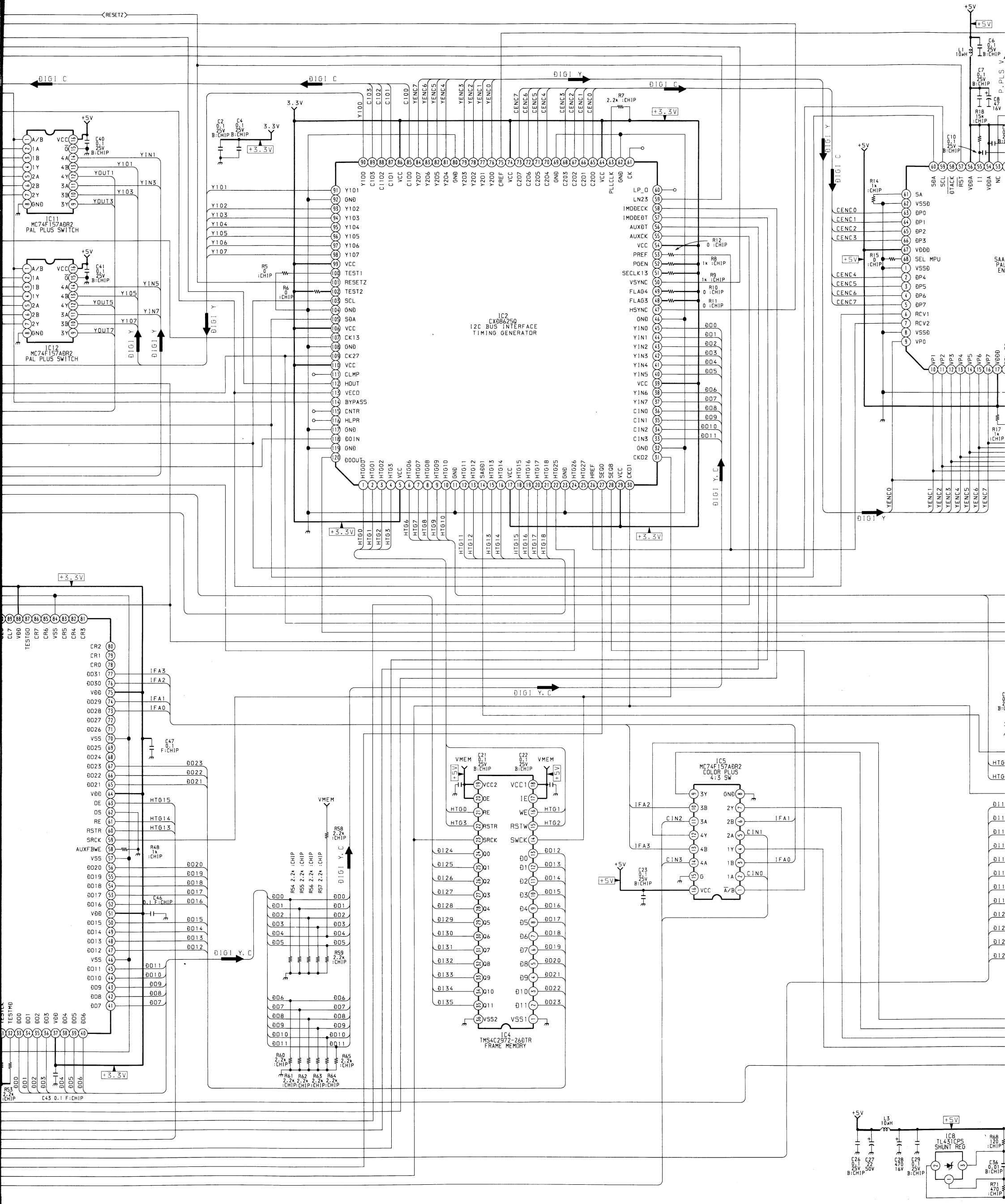
rd < Conductor Side >

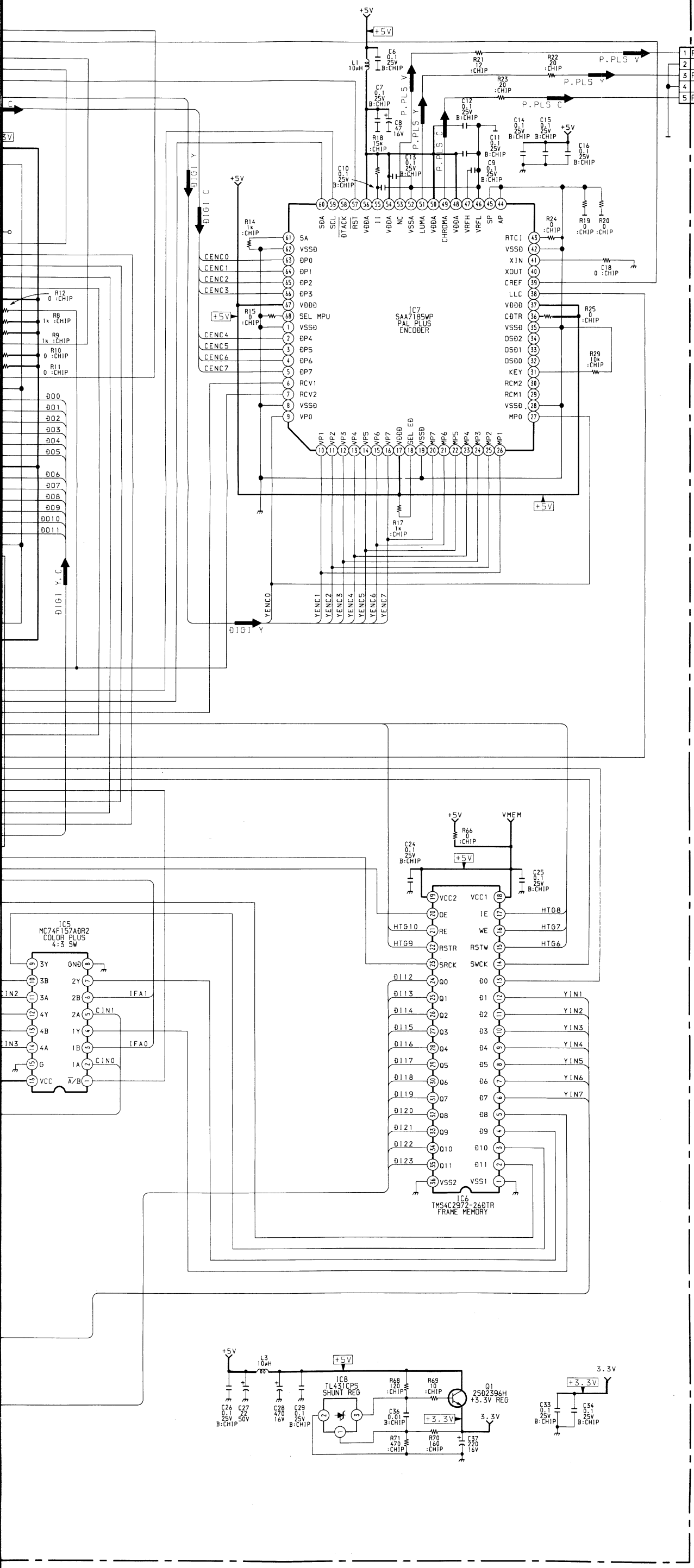
Q Board < Component Side >






B-#SSAE4.<...>-Q..-28WS4
CN1 40P WHT :BTOB
TO B(1/2) BOARD CN1813
RESETZ
DIGI C
DIGI Y
IC9 MC74F157ADR2 PULSE SWITCH
IC10 MC74F157ADR2 PAL PLUS C
IC11 MC74F157ADR2 PAL PLUS SWITCH
IC12 MC74F157ADR2 PAL PLUS SWITCH
IC1 MC74F240DWR2 CLOCK DISTRIBUTION
IC3 CX08624Q SCANLINE VIDEO PROCESSOR PAL PLUS PROCESSOR
+5V
+3.3V
3.3V
Q SCANLINE VIDEO PROCESSOR
PAL PLUS PROCESSOR
I2C BUS INTERFACE, TIMING GENERATOR
PAL PLUS ENCODER


RESETZ
DIGI C
DIGI Y
DIGI Y. C
+5V
+3.3V
VMEM
IC1
MC74F157ADR2
PAL PLUS SWITCH
IC2
CX086250
I2C BUS INTERFACE
TIMING GENERATOR
IC4
TMS4C2972-26DTR
FRAME MEMORY
IC5
MC74F157ADR2
COLOR PLUS
4:3 SW
IC8
TL431CPS
SHUNT REG
P.PLS V



Q BOARD IC VOLTAGE TABLE

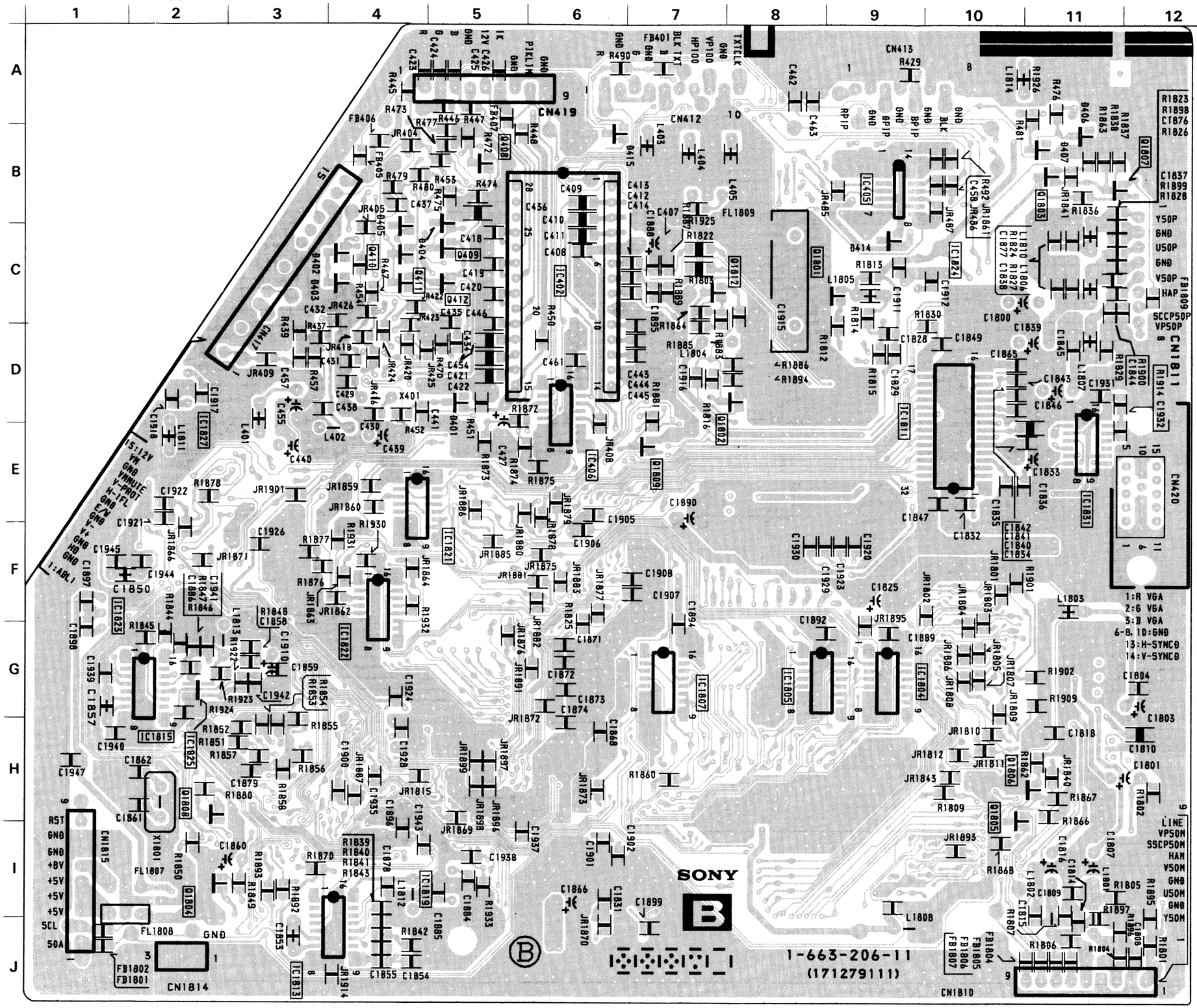
IC Voltage Table								
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC1	2	1.4	IC7	23	1.7	IC10	1	0.1
	3	4.0		24-27	1.3		2	2.0
	4	0.3		29	0.4		3	1.5
	5	4.0		36-37	4.8		4-5	2.0
	7	4.0		38	1.3		6	1.6
	8-9	1.6		39	1.5		7	2.2
	11-12	1.6		40	4.7		9	2.0
	14	4.0		47	2.0		10	1.5
	16	3.8		48	4.7		11-12	2.0
	18	1.5		49	0.6		13	1.5
	20	4.8		50	4.7		14	2.5
IC5	1	0.1		51	1.0		16	4.8
	2	1.2		53	1.0	IC11	1	0.1
	3	0.1		54	4.7		2	1.9
	4	4.0		55	1.0		3	1.4
	5	2.0		56	4.7		4-5	1.9
	6	0.1		57	3.7		6	1.4
	7	2.1		63-64	1.3		7	2.0
	9	2.0	IC9	1	0.1		9	2.1
	10	0.1		2	0.4		10	1.5
	11	2.0		3	1.0		11-12	2.0
	12	2.0		4	0.2		13	1.4
	13	0.1		5	3.8		14	2.0
	14	2.3		6	2.7		16	4.8
	16	4.8		7	3.0	IC12	1	0.1
IC7	2-5	0.4		9	4.3		2	1.6
	6	0.1		10	1.1		3	2.0
	7	0.5		11	2.1		4	1.7
	9-11	1.2		12-13	0.1		5	2.1
	12	1.3		16	4.8		6	1.4
	14-15	1.4					7	1.7
	16	0.7					9-11	0.9
	17-18	0.5					12-13	1.0
	20	0.8					14	1.2
	21-22	1.4					16	4.8

B BOARD

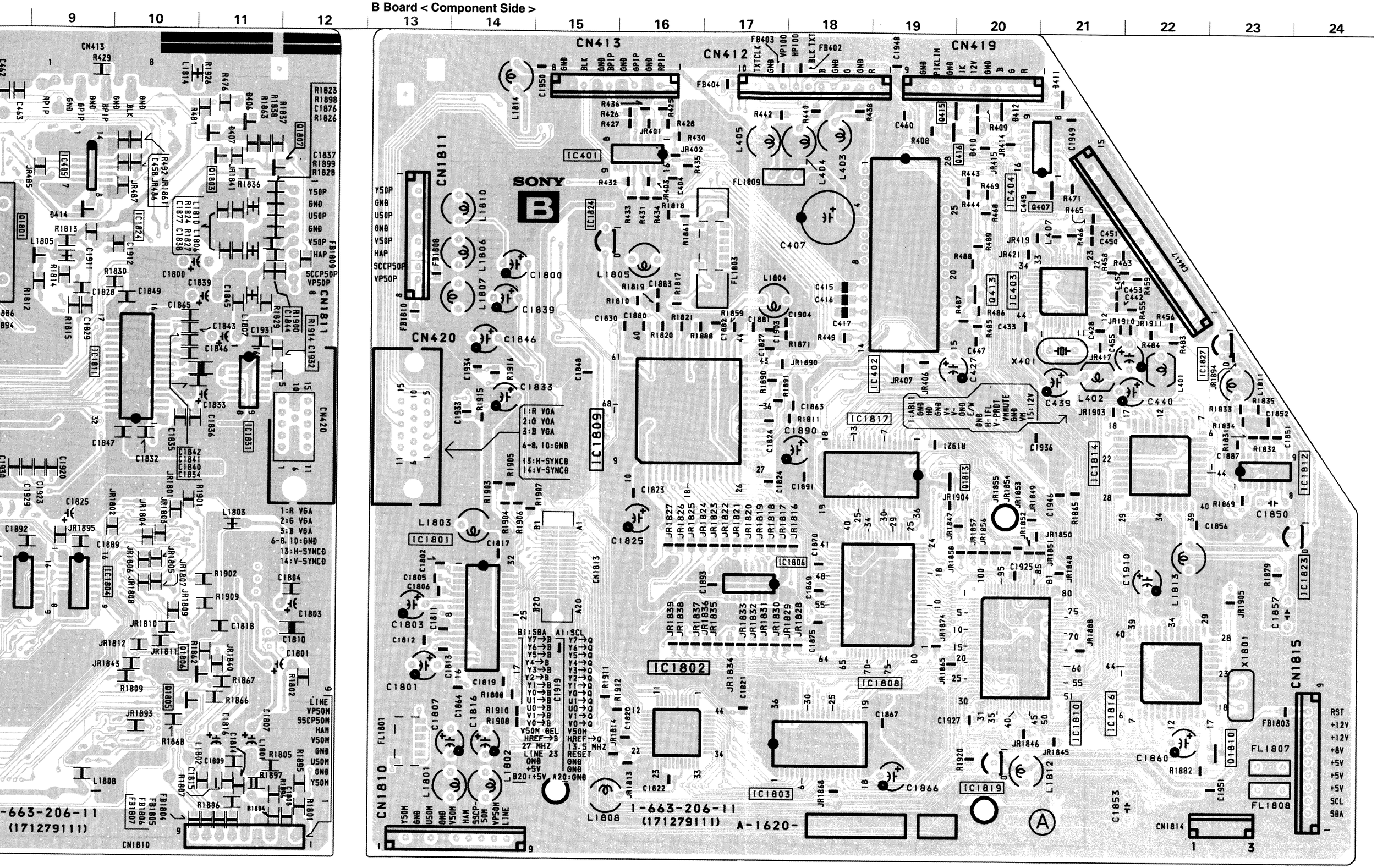
IC		TRANSISTOR	
IC402	C-6	Q411	C-4
IC403	D-20	Q412	C-5
IC405	B-9	Q415	A-19
IC406	E-6	Q416	B-20
IC1801	G-13	Q1801	C-8
IC1803	I-17	Q1802	D-8
IC1804	G-9	Q1804	I-2
IC1805	G-8	Q1805	H-10
IC1806	G-18	Q1807	B-12
IC1807	G-7	Q1808	H-2
IC1808	H-19	Q1809	E-7
IC1809	E-15	Q1810	I-23
IC1810	I-21	Q1812	C-8
IC1811	D-9	Q1813	F-20
IC1812	F-24	DIODE	
IC1813	J-3	D401	D-5
IC1814	F-21	D402	C-3
IC1815	H-2	D403	C-3
IC1816	H-22	D410	B-20
IC1817	E-19	D411	A-21
IC1819	I-5	D412	A-20
IC1821	F-5	D414	C-9
IC1822	G-4	D415	B-7
IC1823	F-1		
IC1824	C-10		
IC1825	H-2		
IC1831	E-11		

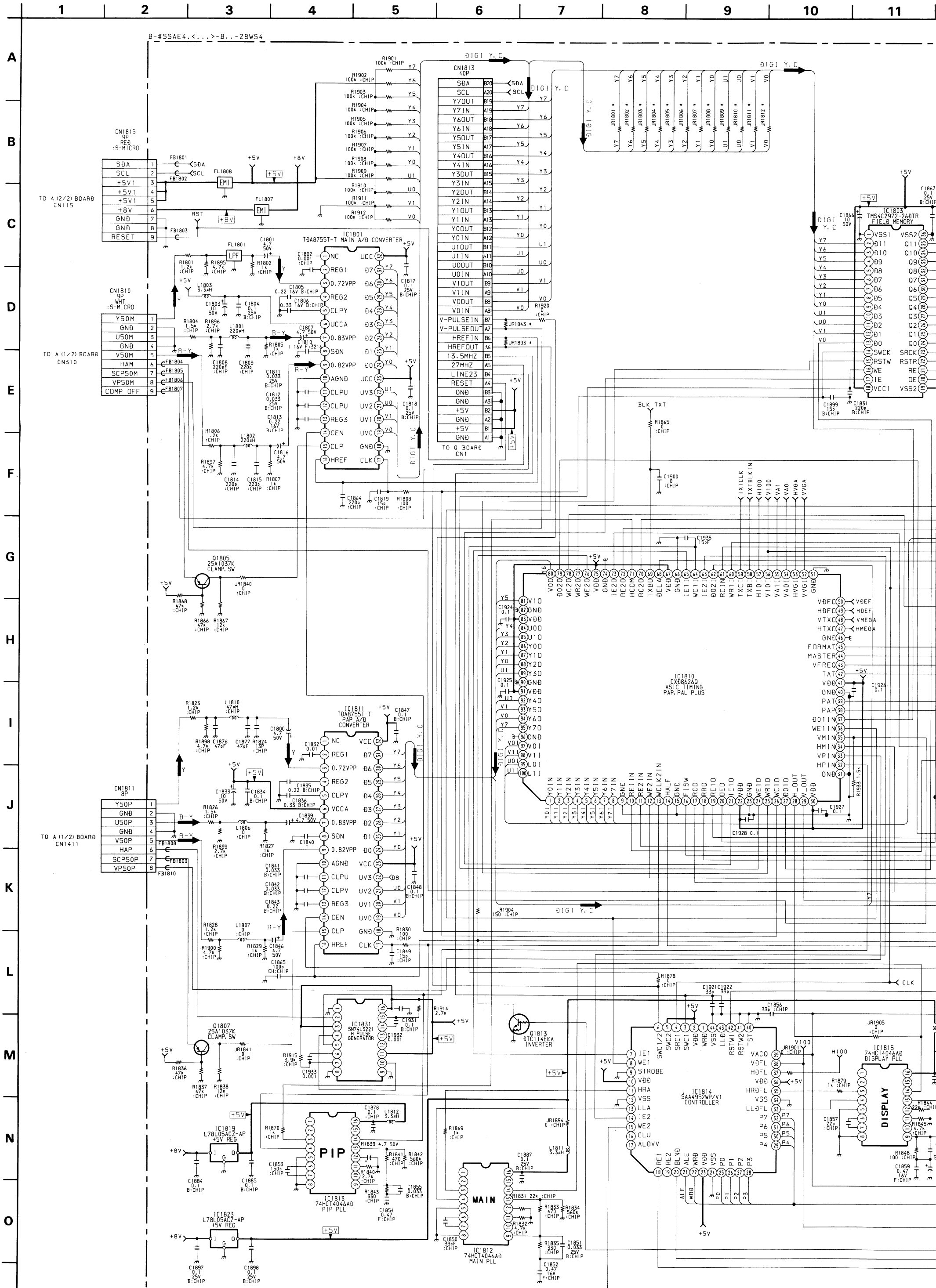
B A/D, D/A CONVERTER, DIGITAL NOISE REDUCER, CRT DRIVER, DEFLECTION PROCESSOR

B Board < Conductor Side >



B Board < Component Side >




B-#SSAE4.<...>-B..-28WS4
CN1815 9P RED :S-MICRO
SDA
SCL
+5V1
+5V1
+5V1
+8V
GND
GND
RESET
TO A (2/2) BOARD CN115
FB1801
FB1802
FB1803
FL1808 EMI
FL1807 EMI
RST
R1901 100k :CHIP
R1902 100k :CHIP
R1903 100k :CHIP
R1904 100k :CHIP
R1905 100k :CHIP
R1906 100k :CHIP
R1907 100k :CHIP
R1908 100k :CHIP
R1909 100k :CHIP
R1910 100k :CHIP
R1911 100k :CHIP
R1912 100k :CHIP
CN1813 40P
SDA B20
SCL A20
Y7OUT B19
Y7IN A19
Y6OUT B18
Y6IN A18
Y5OUT B17
Y5IN A17
Y4OUT B16
Y4IN A16
Y3OUT B15
Y3IN A15
Y2OUT B14
Y2IN A14
Y1OUT B13
Y1IN A13
Y0OUT B12
Y0IN A12
U1OUT B11
U1IN A11
U0OUT B10
U0IN A10
V1OUT B9
V1IN A9
V0OUT B8
V0IN A8
V-PULSEIN B7
V-PULSEOUT A7
HREFIN B6
HREFOUT A6
13.5MHZ B5
27MHZ A5
LINE23 B4
RESET A4
GND B3
GND A3
+5V B2
GND A2
+5V B1
GND A1
TO Q BOARD CN1
DIGI Y, C
JR1801 * JR1802 * JR1803 * JR1804 * JR1805 * JR1806 * JR1807 * JR1808 * JR1809 * JR1810 * JR1811 * JR1812 *
R1920 0 :CHIP
JR1843 *
JR1893 *
IC1801 TDA8755T-T MAIN A/D CONVERTER
NC REG1 0.72VPP REG2 CLPY UCCA 0.83VPP SDN 0.82VPP AGND CLPU CLPU REG3 CEN CLP HREF
UCC D7 D6 D5 D4 D3 D2 D1 D0 UV3 UV2 UV1 UV0 GND CLK
FL1801 LPF
C1801 4.7 50V
C1802 0.001 :CHIP
C1805 0.22 16V B:CHIP
C1806 0.33 16V B:CHIP
C1807 4.7 50V
C1810 1 16V F:3216
C1811 0.033 25V B:CHIP
C1812 0.033 25V B:CHIP
C1813 0.22 16V B:CHIP
C1816 4.7 50V
C1817 0.1 25V B:CHIP
C1818 0.1 25V B:CHIP
R1801 1.2k :CHIP
R1802 1k :CHIP
R1895 4.7k :CHIP
L1803 3.3uH
C1803 10 50V
C1804 0.1 25V B:CHIP
R1804 1.5k :CHIP
R1896 2.7k :CHIP
L1801 220uH
R1805 1k :CHIP
C1808 220p :CHIP
C1809 220p :CHIP
R1806 1.2k :CHIP
L1802 220uH
R1897 4.7k :CHIP
C1814 220p :CHIP
C1815 220p :CHIP
R1807 1k :CHIP
C1864 220p :CHIP
C1819 15p :CHIP
R1808 100 :CHIP
CN1810 9P WHT :S-MICRO
Y50M
GND
U50M
GND
V50M
HAM
SCP50M
VP50M
COMP OFF
TO A (1/2) BOARD CN310
FB1804
FB1805
FB1806
FB1807
Q1805 2SA1037K CLAMP. SW
JR1840 0 :CHIP
R1868 47k :CHIP
R1866 47k :CHIP
R1867 12k :CHIP
IC1811 TDA8755T-T PAP A/D CONVERTER
NC REG1 0.72VPP REG2 CLPY VCCA 0.83VPP SDN 0.82VPP AGND CLPU CLPV REG3 CEN CLP HREF
VCC D7 D6 D5 D4 D3 D2 D1 D0 UV3 UV2 UV1 UV0 GND CLK
C1800 4.7 50V
C1832 0.01
C1835 0.22 B:CHIP
C1836 0.33 B:CHIP
C1839 4.7 50V
C1840 1
C1841 0.033 B:CHIP
C1842 0.033 B:CHIP
C1843 0.22 B:CHIP
C1847 0.1 B:CHIP
C1848 0.1 B:CHIP
R1823 1.2k :CHIP
L1810 47uH :CHIP
R1898 4.7k :CHIP
C1876 47pF
C1877 47pF
R1824 13P :CHIP
C1833 10 50V
C1834 0.1 B:CHIP
R1826 1.5k :CHIP
L1806 0 :CHIP
R1899 2.7k :CHIP
R1827 1k :CHIP
CN1811 8P
Y50P
GND
U50P
GND
V50P
HAP
SCP50P
VP50P
TO A (1/2) BOARD CN1411
FB1808
FB1809
FB1810
R1828 1.2k :CHIP
L1807 0 :CHIP
R1900 4.7k :CHIP
R1829 1k :CHIP
C1846 4.7 50V
C1865 100p CH:CHIP
IC1831 SN74LS221 H PULSE GENERATOR
R1914 2.7k
C1931 0.1 B:CHIP
C1932 0.001
R1915 3.9k :CHIP
C1933 0.001
Q1807 2SA1037K CLAMP. SW
JR1841 0 :CHIP
R1836 47k :CHIP
R1837 47k :CHIP
R1838 12k :CHIP
IC1819 L78L05ACZ-AP +5V REG
IC1823 L78L05ACZ-AP +5V REG
PIP
IC1813 74HCT4046AD PIP PLL
C1878 0.1 :CHIP
L1812 3.3uH
R1870 1k :CHIP
R1839 4.7 50V
R1841 470 :CHIP
R1842 560k :CHIP
R1840 2.7k :CHIP
C1853 150p :CHIP
R1843 330 :CHIP
C1855 0.033 B:CHIP
C1854 0.47 F:CHIP
C1884 0.1 B:CHIP
C1885 0.1 B:CHIP
C1897 0.1 25V B:CHIP
C1898 0.1 25V B:CHIP
MAIN
IC1812 74HCT4046AD MAIN PLL
R1849 1k :CHIP
JR1894 0 :CHIP
L1811 3.3uH
C1887 0.1 25V B:CHIP
R1831 22k :CHIP
R1833 470 :CHIP
R1834 560k :CHIP
R1832 4.7k :CHIP
C1850 39pF :CHIP
R1835 330 :CHIP
C1851 0.033 25V B:CHIP
C1852 0.47 16V F:CHIP
Q1813 DTC114EKA INVERTER
R1878 0 :CHIP
C1921 33p
C1922 33p
C1856 33p :CHIP
JR1905 0 :CHIP
JR1901 0 :CHIP
V100
H100
IC1814 SAA4952WP/V1 CONTROLLER
IE1 WE1 STROBE VDD HRA VSS LLA IE2 WE2 CLU ALDVV
SWC1/2 SRC1 SWC1 VDD WRD VSS LLD RSTW1 RSTW2 TST
VACQ VDFL HDFL VDD HRDFL VSS LLDFL P7 P6 P5 P4
RE1 RE2 BLND ALE WRD VDD VSS PD P1 P2 P3
IC1815 74HCT4046AD DISPLAY PLL
DISPLAY
R1879 1k :CHIP
R1844 22k :CHIP
R1845 4.7k :CHIP
R1848 100 :CHIP
C1857 22p :CHIP
C1859 0.47 16V F:CHIP
IC1803 TMS4C2972-26DTR FIELD MEMORY
VSS1 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0 SWCK RSTW WE IE VCC1
VSS2 Q11 Q10 Q9 Q8 Q7 Q6 Q5 Q4 Q3 Q2 Q1 Q0 SRCK RSTR RE DE VSS2
C1866 10 50V
C1867 0.1 25V B:CHIP
C1899 15p B:CHIP
C1831 220p B:CHIP
BLK TXT
R1865 0 :CHIP
C1900 0 :CHIP
TXTCLK TXTBLKIN H100 V100 VA1 VA0 HVGA VVGA
C1935 15pF
IC1810 CX88626Q ASIC TIMING PAP, PAL PLUS
VDD D02D WC2D WR2D WE2D VDD IE2D RE2D HCOM RC2D TXBD DELA GND IE1D WC1D IE2D D02D RCIN WR1D TXCD TXBD H10D V10D VA1D VA0D HVGD VVGD GND
VDFD HDFD VTXD HTXD GND FORMAT MASTER VFREQ TAT VDD GND PAT PAP D01IN WE1IN VMIN HMIN VPIN HPIN GND
Y0IN Y1IN Y2IN Y3IN Y4IN Y5IN Y6IN Y7IN GND RE1IN RE2IN WE2IN MCLK2IN HALF GND FISW RCO RRO RE1O DEO IE1O VDD GND WE1O WR1O WC1O D01O V_OUT V_OUT VDD
R1933 1.5k
C1924 0.1
C1925 0.1
C1926 0.1
C1927 0.1
C1928 0.1
JR1904 150 :CHIP
CLK
DIGI Y, C

IC1803 TMS4C2972-26DTR FIELD MEMORY

IC1804 HEF4053BT PAP SWITCH

IC1805 HEF4053BT PAP SWITCH

IC1806 HEF4053BT PAP SWITCH

IC1807 HEF4053BT PAP SWITCH

IC1808 SAA4990H/V2 DIGITAL NOISE REDUCE ZOOMING

IC1809 SDA9280A41 D/A CONVERTER

IC1815 74HCT4046AD DISPLAY PLL

IC1816 P83C654KBA SOFTWARE

IC1817 TMS4C2972-26DTR FIELD MEMORY

IC1821 HEF4053BT PICTURE TEXT SW

IC1822 HEF4053BT PICTURE TEXT SW

IC1824 L78L05ACZ-AP +5V REG

IC1825 TC4S66F FREE RUN PLL

Q1804 DTC144EK RESET SW

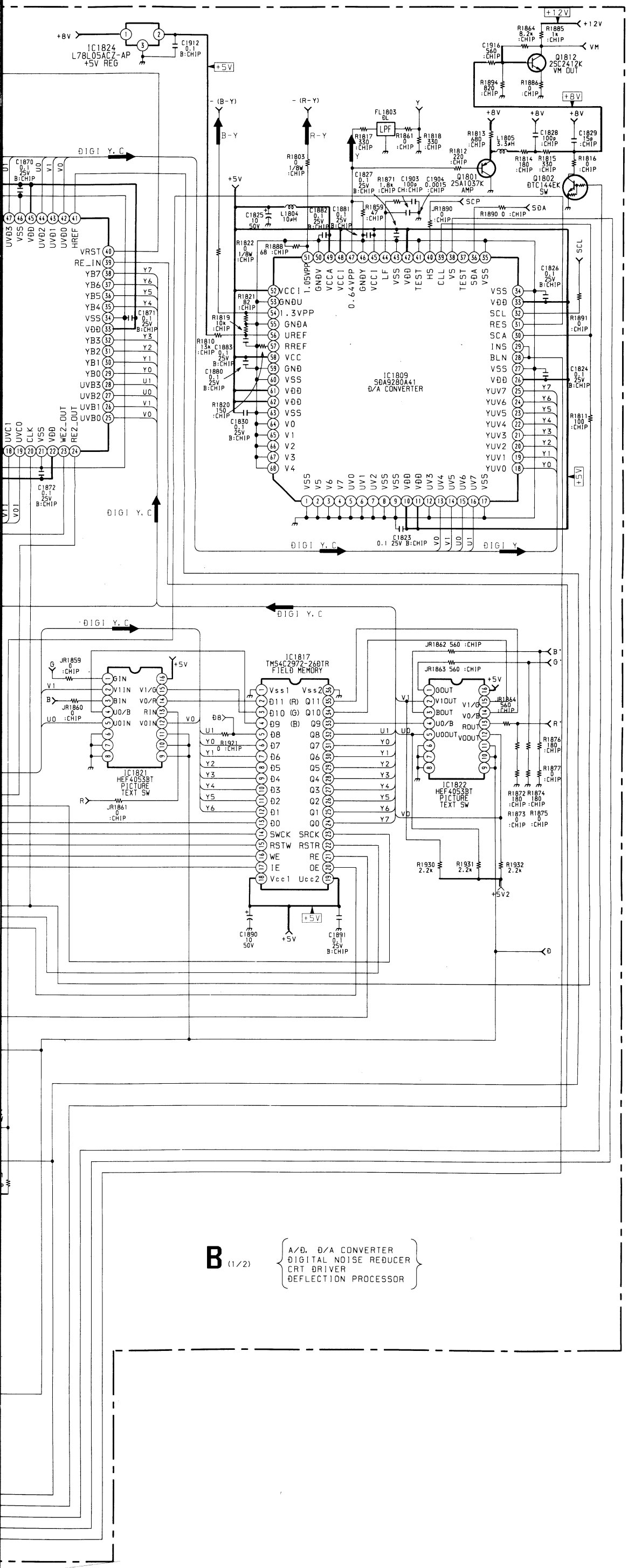
Q1808 DTC144EK INVERTER

Q1809 DTC144EK RESET SW

Q1810 DTC144EK INVERTER

DISPLAY

B (1/2) A/D, D/A CONVERTER
DIGITAL NOISE REDUCER
CRT DRIVER
DEFLECTION PROCESSOR



B BOARD * MARK

Model / Ref. No.	28WS4A	28WS4B	28WS4D	28WS4E	28WS4K	28WS4R
JR1801	—	0:CHIP	—	—	—	—
JR1802	—	0:CHIP	—	—	—	—
JR1803	—	0:CHIP	—	—	—	—
JR1804	—	0:CHIP	—	—	—	—
JR1805	—	0:CHIP	—	—	—	—
JR1806	—	0:CHIP	—	—	—	—
JR1807	—	0:CHIP	—	—	—	—
JR1808	—	0:CHIP	—	—	—	—
JR1809	—	0:CHIP	—	—	—	—
JR1810	—	0:CHIP	—	—	—	—
JR1811	—	0:CHIP	—	—	—	—
JR1812	—	0:CHIP	—	—	—	—
JR1843	—	0:CHIP	—	—	—	—
JR1893	0:CHIP	—	0:CHIP	0:CHIP	0:CHIP	0:CHIP

B (1/2) BOARD IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC1812	3-4	2.4
	6-7	0.7
	9	4.6
	11-13	4.7
	14	0.3
	16	5.0
IC1813	3-4	2.4
	6-7	0.7
	9	4.6
	11-13	4.7
	14	0.3
	16	5.0
IC1815	1	5.0
	2	2.3
	3-4	2.5
	6-7	0.8
	9-11	3.0
	12	4.5
	13	3.0
	14	0.4
	15	0.2
	16	5.2
IC1821	2	2.5
	4-5	2.3
	12	2.0
	14	2.0
	15	2.6
	16	8.0
IC1822	2	2.9
	4-5	2.6
	12	2.3
	14	2.1
	15	2.8
	16	8.0

B BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q411	0.1	4.8	4.8
Q412	0.1	4.8	4.8
Q415	1.8	0.1	-
Q416	0.1	5.6	-
Q1801	0.1	-	0.9
Q1802	4.0	0.1	0.1
Q1804	0.3	4.8	0.1
Q1805	2.5	1.3	0.7
Q1807	2.5	1.3	0.7
Q1808	0.1	4.7	0.1
Q1809	0.1	0.1	0.1
Q1810	0.1	4.8	-
Q1812	0.5	10.5	-
Q1813	0.1	3.7	0.1

B (2/2)

B-#SSAE4.<...>-B..-28WS4

TO A (1/2) BOARD
CN1413

CN413
8P
YEL
:S-MICRO

TO A (2/2) BOARD
CN2012

CN412
10P
WHT
:S-MICRO

IC405
74LVC08D
RGB BUFFER

D414
DA204K

C458
0.1
B:CHIP

R492
120
:CHIP

C460
15pF
:CHIP

FB401
FB402
FB403
FB404

TXTCLK
HMEGA
VMEGA

BLK TXT

D415
DAN202

TXTBLKIN

C409
1 16V F:3216

C410
1 16V F:3216

C411
1 16V F:3216

C413
0.022 B:CHIP

C412
0.022 B:CHIP

C414
0.47 25V F:CHIP

C415 1 16V
C416 1 16V
C417 1 16V

C443
0.1 B:CHIP

C444
0.1 B:CHIP

C445
0.1 B:CHIP

IC402
TDA4780/V3
CRT DRIVER

R450
120k
:CHIP

R451
150k
:CHIP

R449
1k
:CHIP

D401
DAN202K

R452
10k
:CHIP

C441
0.022
25V
B:CHIP

HDEF

HP100

R467
470
:CHIP

JR418
0
:CHIP

JR1911
0
:CHIP

JR1910
0
:CHIP

JR420
0
:CHIP

C434
100p
:CHIP

C433
0.1
25V
B:CHIP

R470
1.8k
:CHIP

C435
0.0015
:CHIP

JR423
0
:CHIP

JR422
0
:CHIP

JR421
0 :CHIP

JR426
100
:CHIP

JR424
0
:CHIP

L401
470uH

L402
470uH

C438
0.1
25V
B:CHIP

C439
10
50V

C440
10
50V

VP100

VDEF

IC403
SDA9361
DEFLECTION
PROCESSOR

R483
3.9k
:CHIP

R484
1k
:CHIP

R455
3.9k
:CHIP

R456
100k
:CHIP

R457
120k
:CHIP

R439
68k
:CHIP

R458
1k
:CHIP

R459
1k
:CHIP

R463
1k
:CHIP

C428
0.1
25V
B:CHIP

C455
10
50V

JR417
0
:CHIP

R469
100
:CHIP

C429
27p
:CHIP

C430
27p
:CHIP

R468
100
:CHIP

X401
24.576MHz
NEW

C431
0.1
25V
B:CHIP

C453
0.1 25V B:CHIP

C452
27p
:CHIP

C432
0.1 25V B:CHIP

C451
0.1
25V
B:CHIP

C450
0.1
25V
B:CHIP

R465
10k
:CHIP

R466
1k :CHIP

D402
DAN202K

D403
MA3033L-TX

L407
3.3uH
:CHIP

CN417
15P
WHT
:S-MICRO

ABL	1
GND	2
HD	3
GND	4
V+	5
V-	6
GND	7
E/W	8
GND	9
H-PULSE	10
V-PROT	11
TEXT BLK	12
GND	13
VM	14
+12V	15

JR409
0
:CHIP

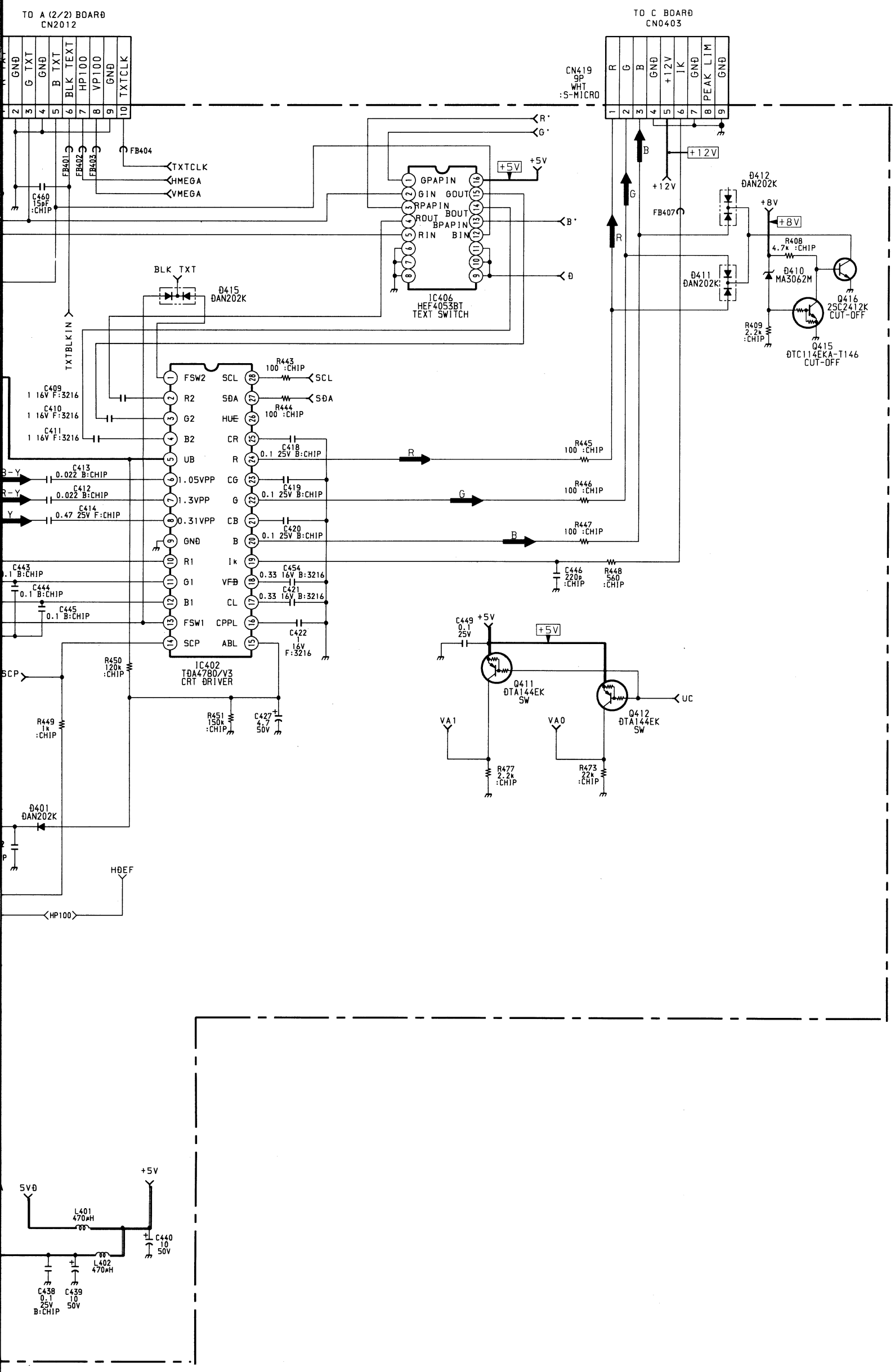
FB405

FB406

TO D BOARD
CN0743

+12V VM BLK TXT

+5V +8V 5VA 5VD HDEF SCP SCL SDA CLK VM BLK TXT



B (2/2) BOARD
IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC402	2-4	5.0
	5	7.8
	6-7	4.0
	8	3.7
	10-12	5.0
	14	0.7
	16	4.7
	17	5.1
	18	1.8
	19	7.5
	20	2.5
	21	3.3
	22	2.8
	23	3.3
	24	2.9
	25	3.3
	27	4.0
	28	3.8
IC405	5	3.2
	9	3.2
	13-14	3.2
IC406	16	4.8

Q416
2SC2412K
CUT-OFF

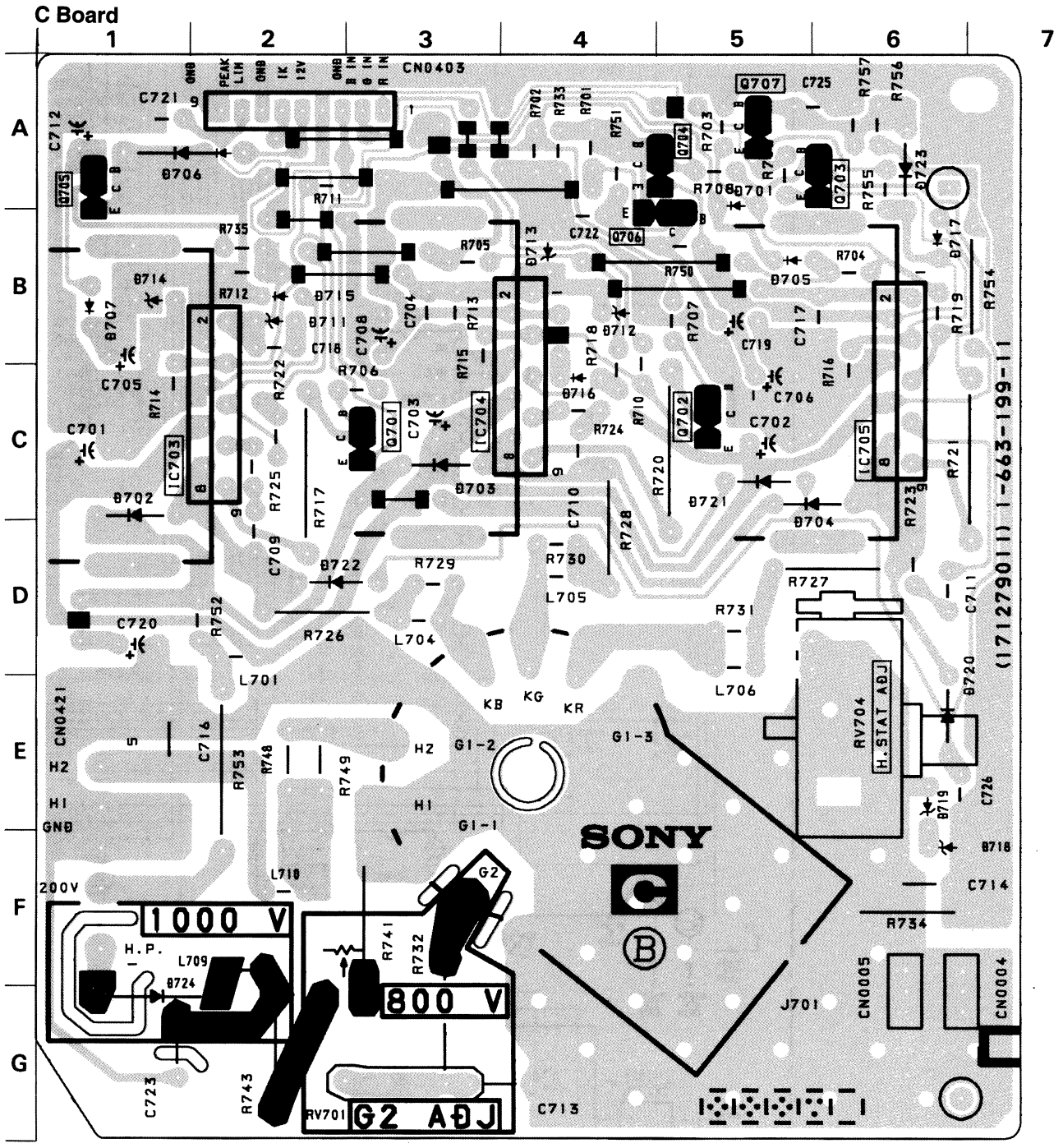
5
A-T146
OFF

B (2/2) BOARD
IC VOLTAGE TABLE

IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC402	2-4	5.0
	5	7.8
	6-7	4.0
	8	3.7
	10-12	5.0
	14	0.7
	16	4.7
	17	5.1
	18	1.8
	19	7.5
	20	2.5
	21	3.3
	22	2.8
	23	3.3
	24	2.9
	25	3.3
	27	4.0
	28	3.8
IC405	5	3.2
	9	3.2
	13-14	3.2
IC406	16	4.8

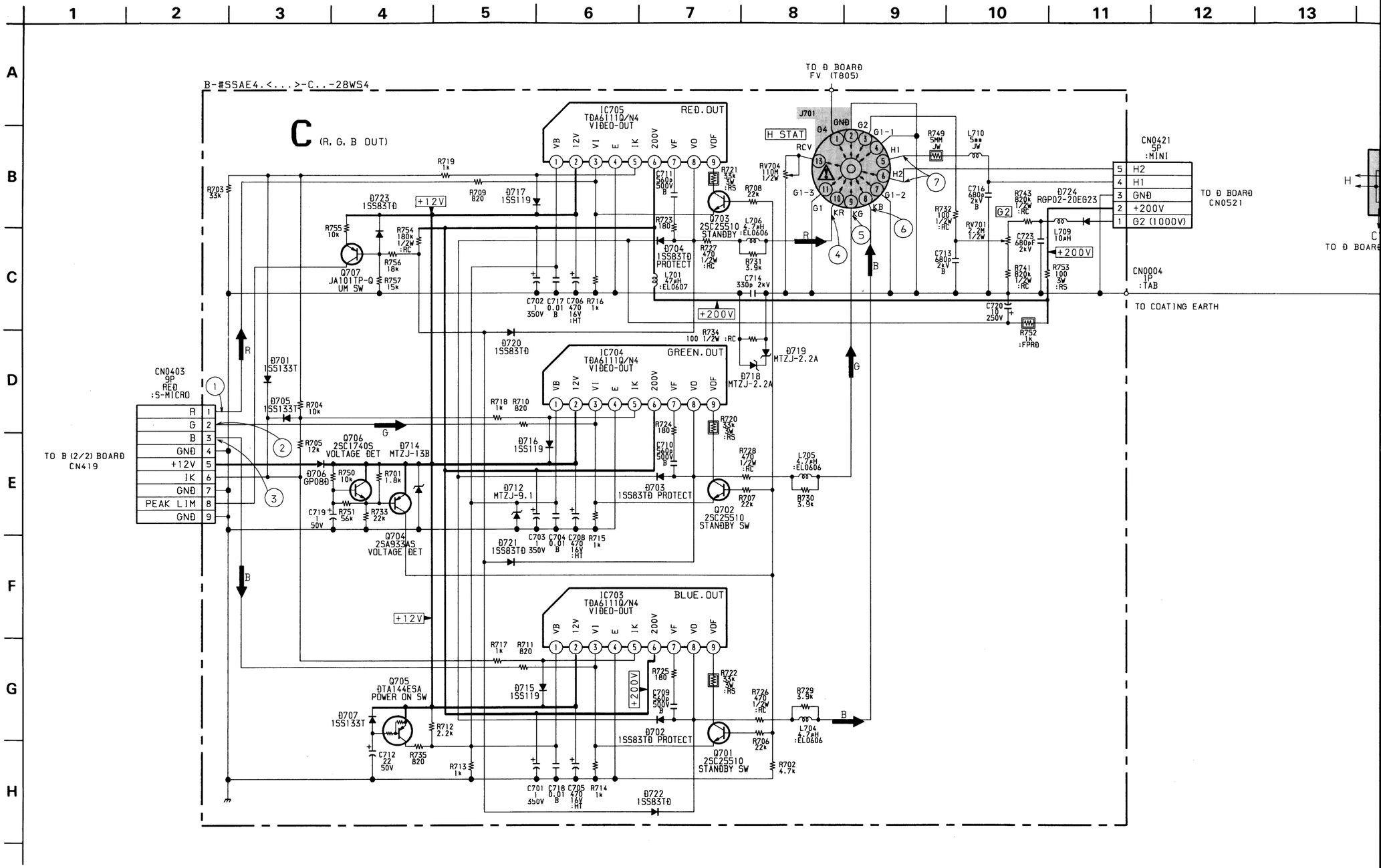
C [RGB OUT]

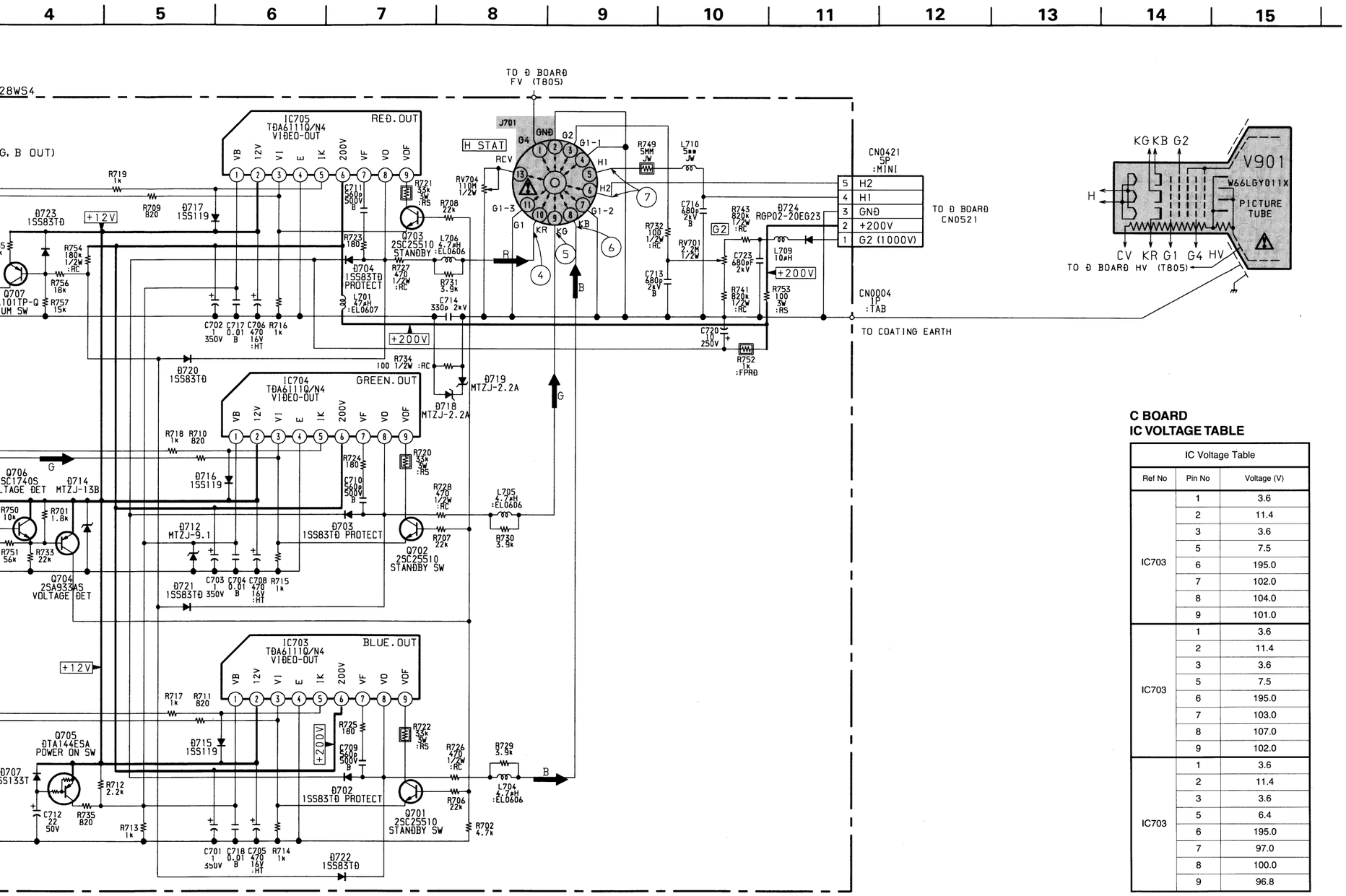
C Board



C BOARD

IC	
IC703	C-1
IC704	C-3
IC705	C-6
TRANSISTOR	
Q701	C-3
Q702	C-5
Q703	A-6
Q704	A-5
Q705	A-1
Q706	B-4
Q707	A-5
DIODE	
D701	A-5
D702	C-1
D703	C-3
D704	C-6
D705	B-5
D706	A-1
D707	B-1
D712	B-4
D714	B-1
D715	B-2
D716	C-4
D717	B-6
D718	F-6
D719	E-6
D720	E-6
D721	C-5
D722	D-2
D723	A-6
D724	F-1
VARIABLE RESISTOR	
RV701	G-1
RV704	E-6





WAVEFORMS C BOARD

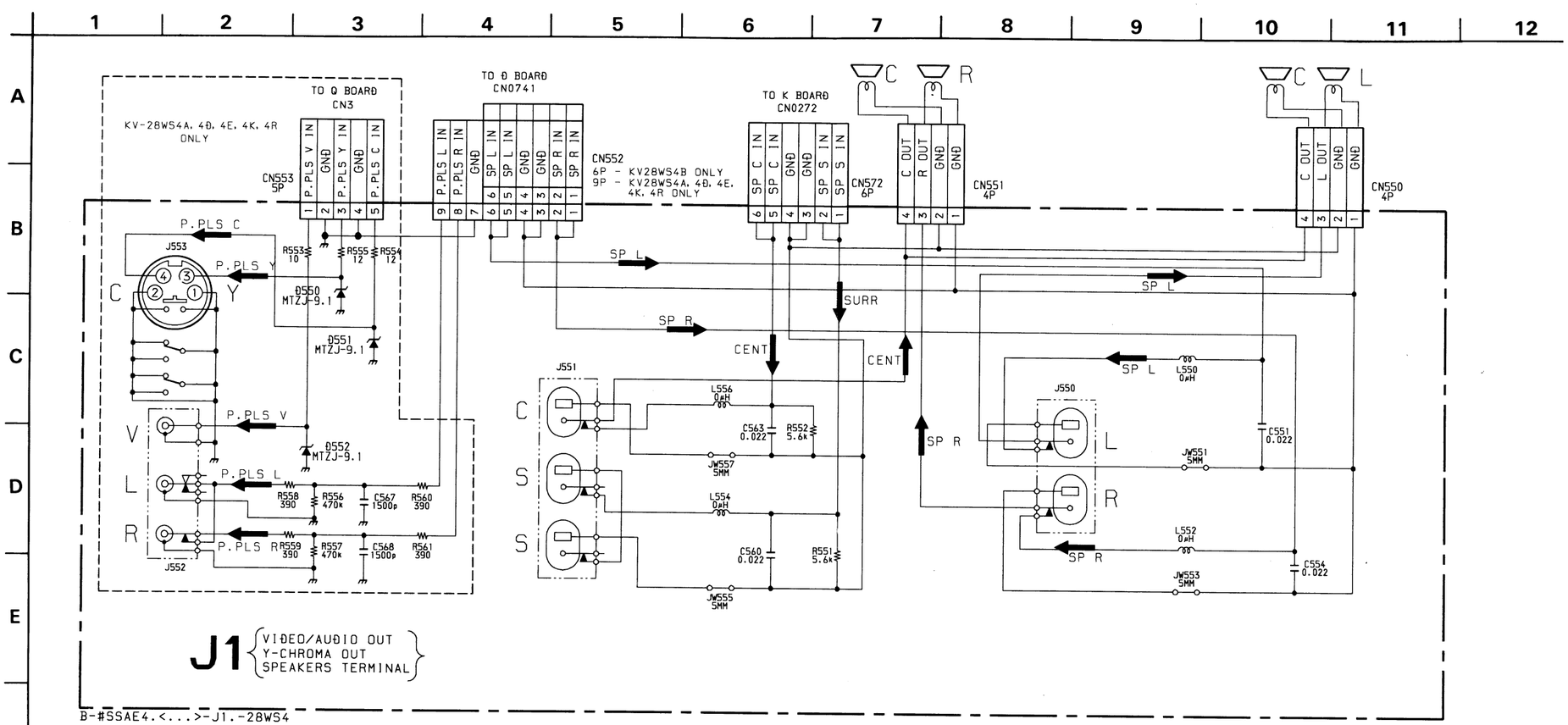
① 2.0 Vp-p (2H)	② 2.0 Vp-p (2H)	③ 2.0 Vp-p (2H)
④ 107 Vp-p (2H)	⑤ 95 Vp-p (2H)	⑥ 100 Vp-p (2H)
⑦ 30 Vp-p (2H)		

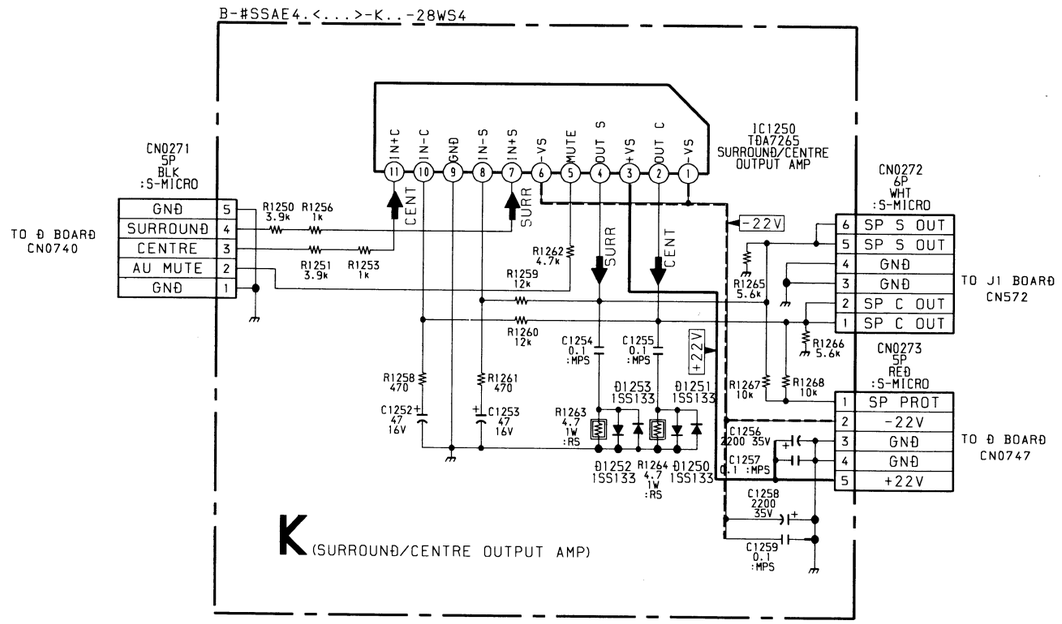
C BOARD IC VOLTAGE TABLE

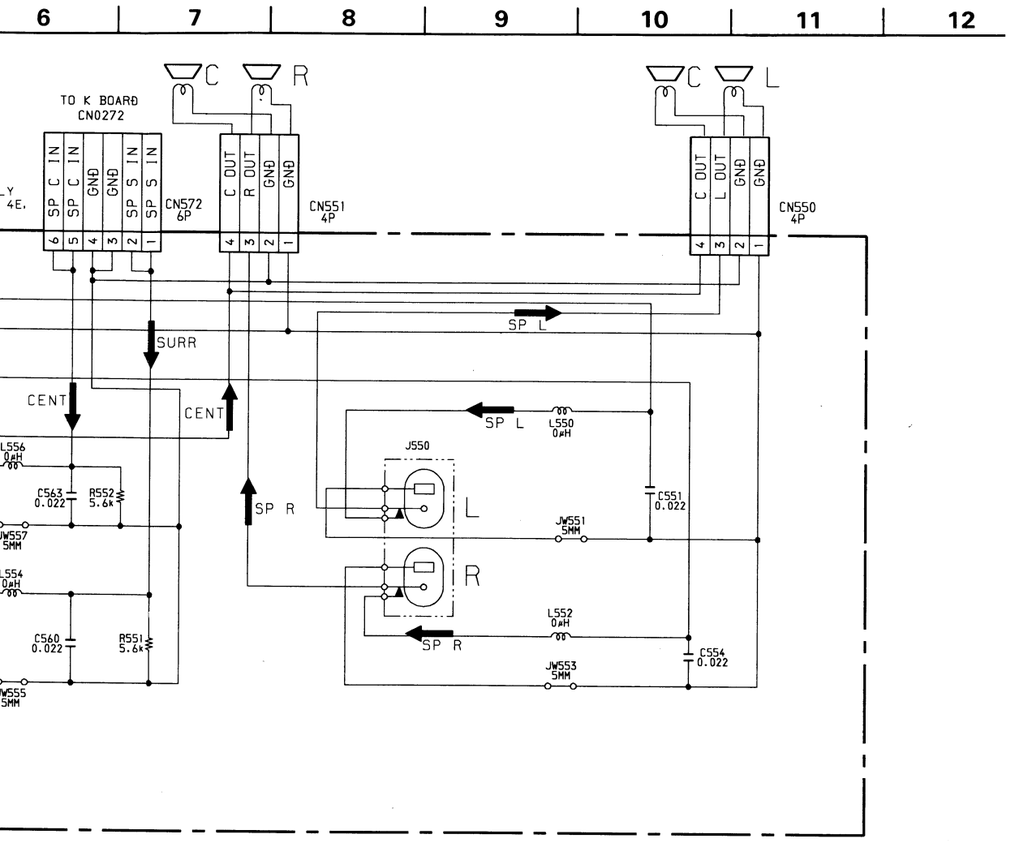
IC Voltage Table		
Ref No	Pin No	Voltage (V)
IC703	1	3.6
	2	11.4
	3	3.6
	5	7.5
	6	195.0
	7	102.0
	8	104.0
	9	101.0
IC703	1	3.6
	2	11.4
	3	3.6
	5	7.5
	6	195.0
	7	103.0
	8	107.0
	9	102.0
IC703	1	3.6
	2	11.4
	3	3.6
	5	6.4
	6	195.0
	7	97.0
	8	100.0
	9	96.8

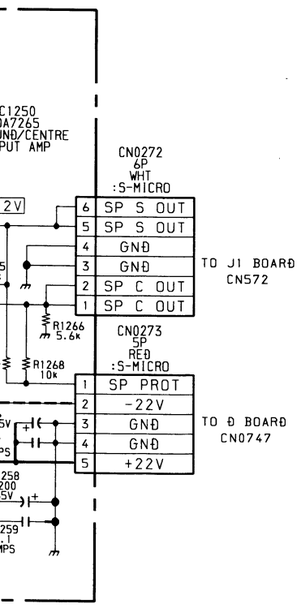
C BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q701	4.2	3.7	3.6
Q702	4.2	3.7	3.6
Q703	4.2	3.7	3.6
Q704	10.7	11.2	11.3
Q705	11.3	3.6	11.3
Q706	11.3	11.3	10.7
Q707	11.8	9.8	11.3


TO Q BOARD
CN3
KV-28WS4A, 4D, 4E, 4K, 4R ONLY
CN553 5P
P.PLS V IN
GND
P.PLS Y IN
GND
P.PLS C IN
TO D BOARD
CN0741
P.PLS L IN
P.PLS R IN
GND
SP L IN
SP L IN
GND
GND
SP R IN
SP R IN
CN552
6P - KV28WS4B ONLY
9P - KV28WS4A, 4D, 4E, 4K, 4R ONLY
TO K BOARD
CN0272
SP C IN
SP C IN
GND
GND
SP S IN
SP S IN
CN572 6P
C OUT
R OUT
GND
GND
CN551 4P
C OUT
L OUT
GND
GND
CN550 4P
P.PLS C
P.PLS Y
P.PLS V
P.PLS L
P.PLS R
J553
J552
J551
J550
R553 10
R555 12
R554 12
D550 MTZJ-9.1
D551 MTZJ-9.1
D552 MTZJ-9.1
R558 390
R556 470k
C567 1500p
R560 390
R559 390
R557 470k
C568 1500p
R561 390
SP L
SP R
SURR
CENT
L556 0μH
C563 0.022
R552 5.6k
JW557 5MM
L554 0μH
C560 0.022
R551 5.6k
JW555 5MM
L550 0μH
C551 0.022
JW551 5MM
L552 0μH
C554 0.022
JW553 5MM
J1
VIDEO/AUDIO OUT
Y-CHROMA OUT
SPEAKERS TERMINAL
B-#SSAE4.<...>-J1.-28WS4


B-#SSAE4.<...>-K..-28WS4
TO D BOARD
CN0740
CN0271
SP
BLK
:S-MICRO
GND 5
SURROUND 4
CENTRE 3
AU MUTE 2
GND 1
R1250 3.9k
R1256 1k
R1251 3.9k
R1253 1k
IC1250
TDA7265
SURROUND/CENTRE
OUTPUT AMP
IN+C
IN-C
GND
IN-S
IN+S
-VS
MUTE
OUT S
+VS
OUT C
-VS
CENT
SURR
R1262 4.7k
R1259 12k
R1260 12k
C1254 0.1 :MPS
C1255 0.1 :MPS
+22V
R1258 470
R1261 470
C1252 47 16V
C1253 47 16V
R1263 4.7 1W :RS
R1264 4.7 1W :RS
D1253 1SS133
D1251 1SS133
D1252 1SS133
D1250 1SS133
-22V
R1265 5.6k
R1266 5.6k
R1267 10k
R1268 10k
C1256 2200 35V
C1257 0.1 :MPS
C1258 2200 35V
C1259 0.1 :MPS
CN0272
6P
WHT
:S-MICRO
SP S OUT 6
SP S OUT 5
GND 4
GND 3
SP C OUT 2
SP C OUT 1
TO J1 BOARD
CN572
CN0273
5P
RED
:S-MICRO
SP PROT 1
-22V 2
GND 3
GND 4
+22V 5
TO D BOARD
CN0747
K
(SURROUND/CENTRE OUTPUT AMP)





CN0272
6P
WHT
:S-MICRO

6	SP S OUT
5	SP S OUT
4	GND
3	GND
2	SP C OUT
1	SP C OUT

TO J1 BOARD
CN572

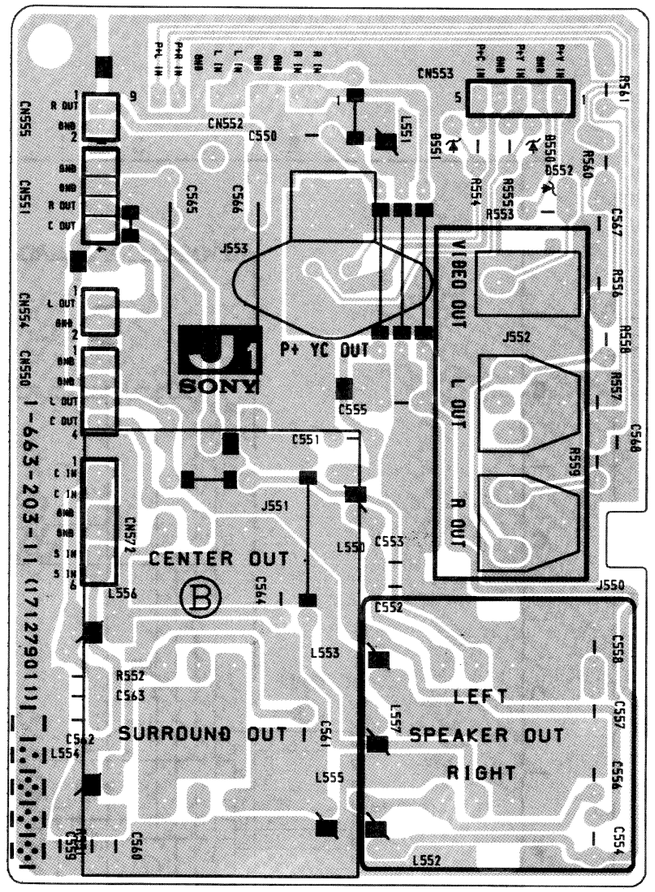
CN0273
5P
RED
:S-MICRO

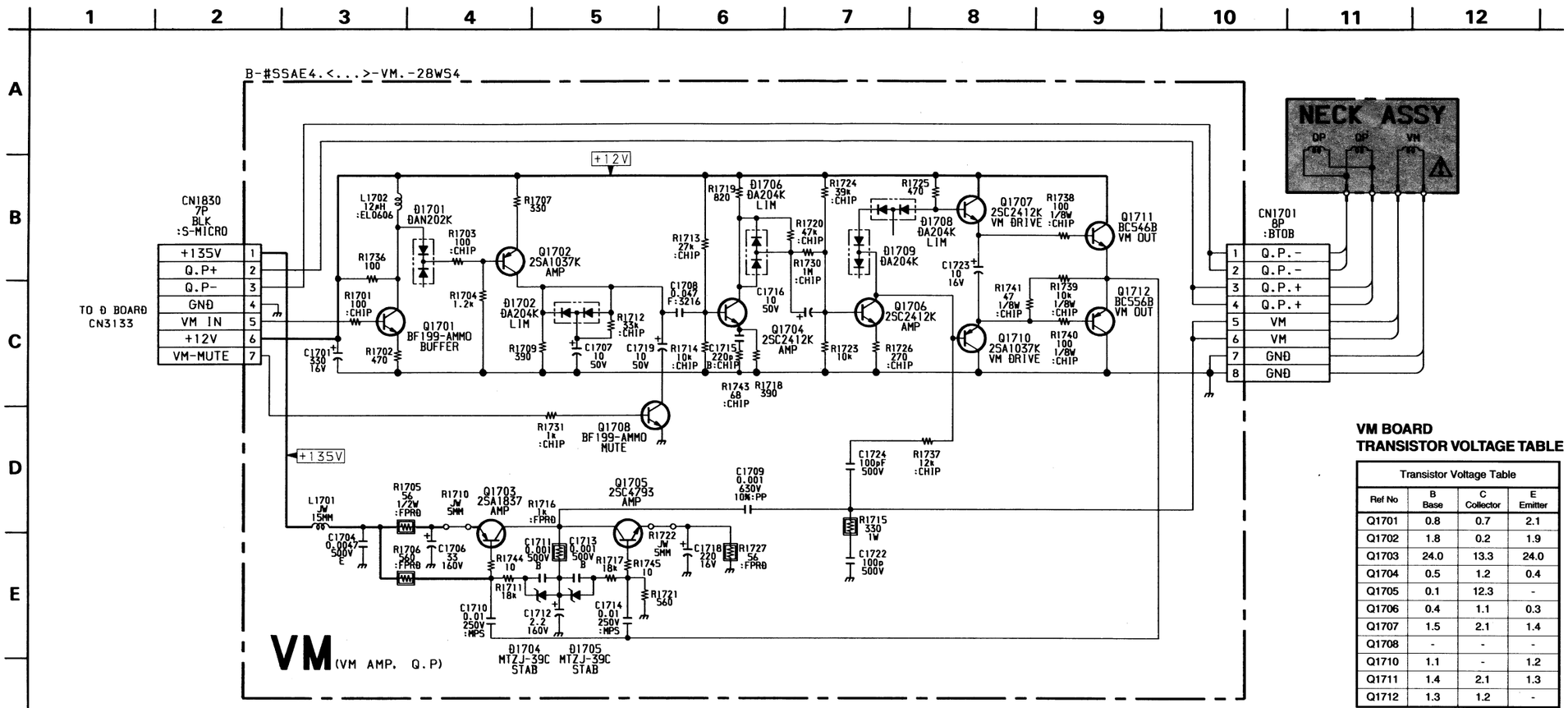
1	SP PROT
2	-22V
3	GND
4	GND
5	+22V

TO D BOARD
CN0747

J1 [VIDEO/AUDIO OUT, Y-CHROMA OUT, SPEAKERS TERMINAL] K [SURROUND/CENTRE OUT AMP]

J1 Board

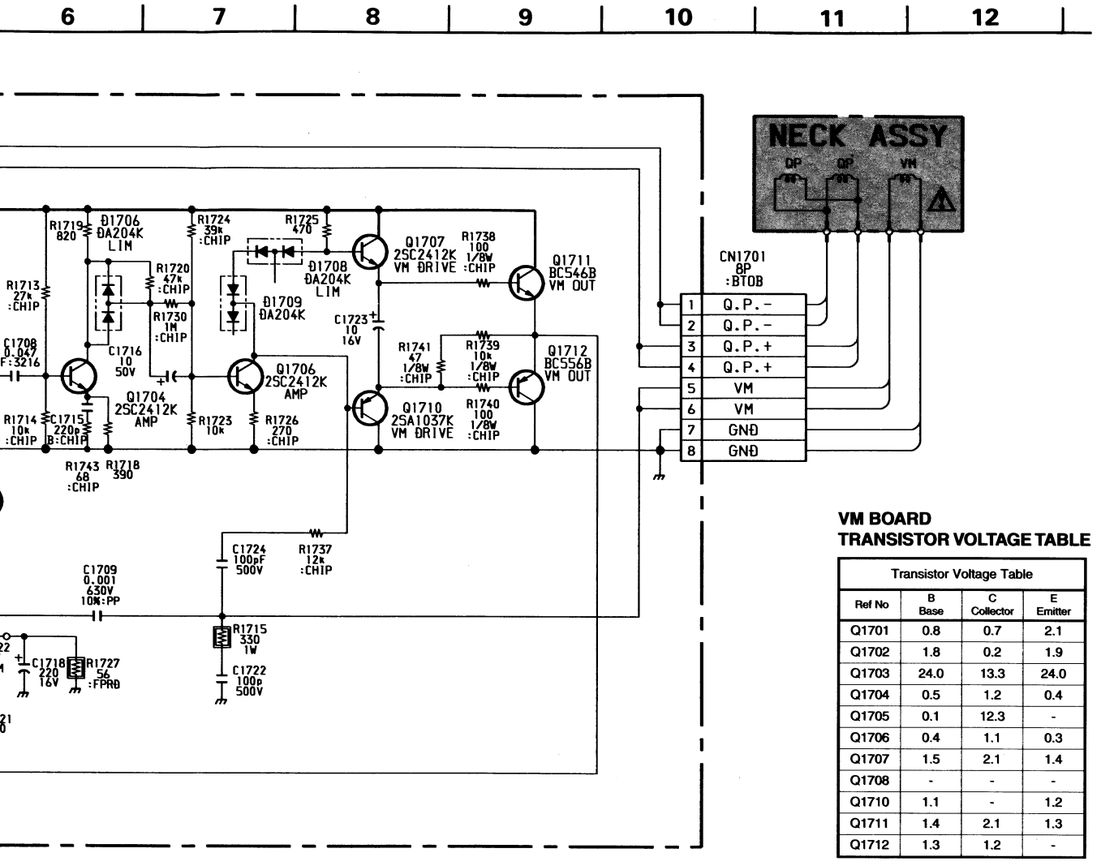




VM BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table

Ref No	B Base	C Collector	E Emitter
Q1701	0.8	0.7	2.1
Q1702	1.8	0.2	1.9
Q1703	24.0	13.3	24.0
Q1704	0.5	1.2	0.4
Q1705	0.1	12.3	-
Q1706	0.4	1.1	0.3
Q1707	1.5	2.1	1.4
Q1708	-	-	-
Q1710	1.1	-	1.2
Q1711	1.4	2.1	1.3
Q1712	1.3	1.2	-

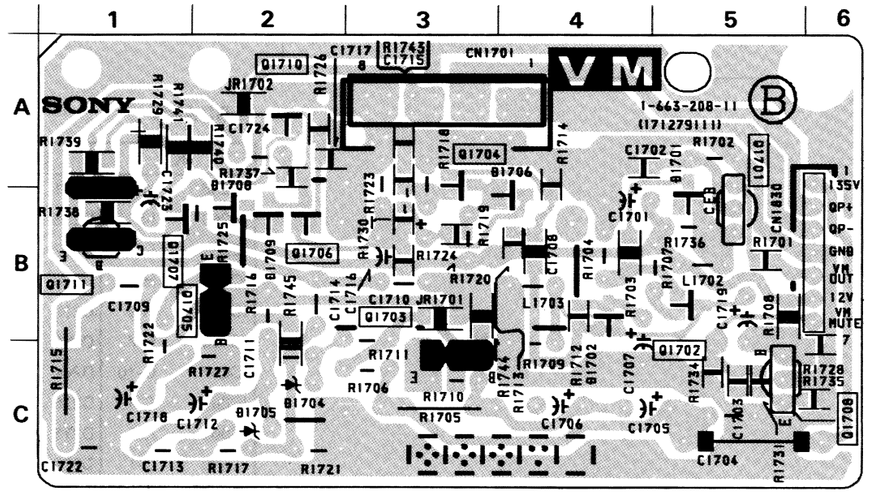


VM BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q1701	0.8	0.7	2.1
Q1702	1.8	0.2	1.9
Q1703	24.0	13.3	24.0
Q1704	0.5	1.2	0.4
Q1705	0.1	12.3	-
Q1706	0.4	1.1	0.3
Q1707	1.5	2.1	1.4
Q1708	-	-	-
Q1710	1.1	-	1.2
Q1711	1.4	2.1	1.3
Q1712	1.3	1.2	-

VM [VM OUT, Q.P]

VM Board



VM BOARD

TRANSISTOR	
Q1701	A-5
Q1702	C-5
Q1703	B-3
Q1704	A-3
Q1705	B-2
Q1706	B-2
Q1707	B-1
Q1708	C-6
Q1710	A-2
Q1711	B-1
Q1712	A-1
DIODE	
D1701	A-5
D1702	C-4
D1704	C-2
D1705	C-2
D1706	A-4
D1708	B-2
D1709	B-2

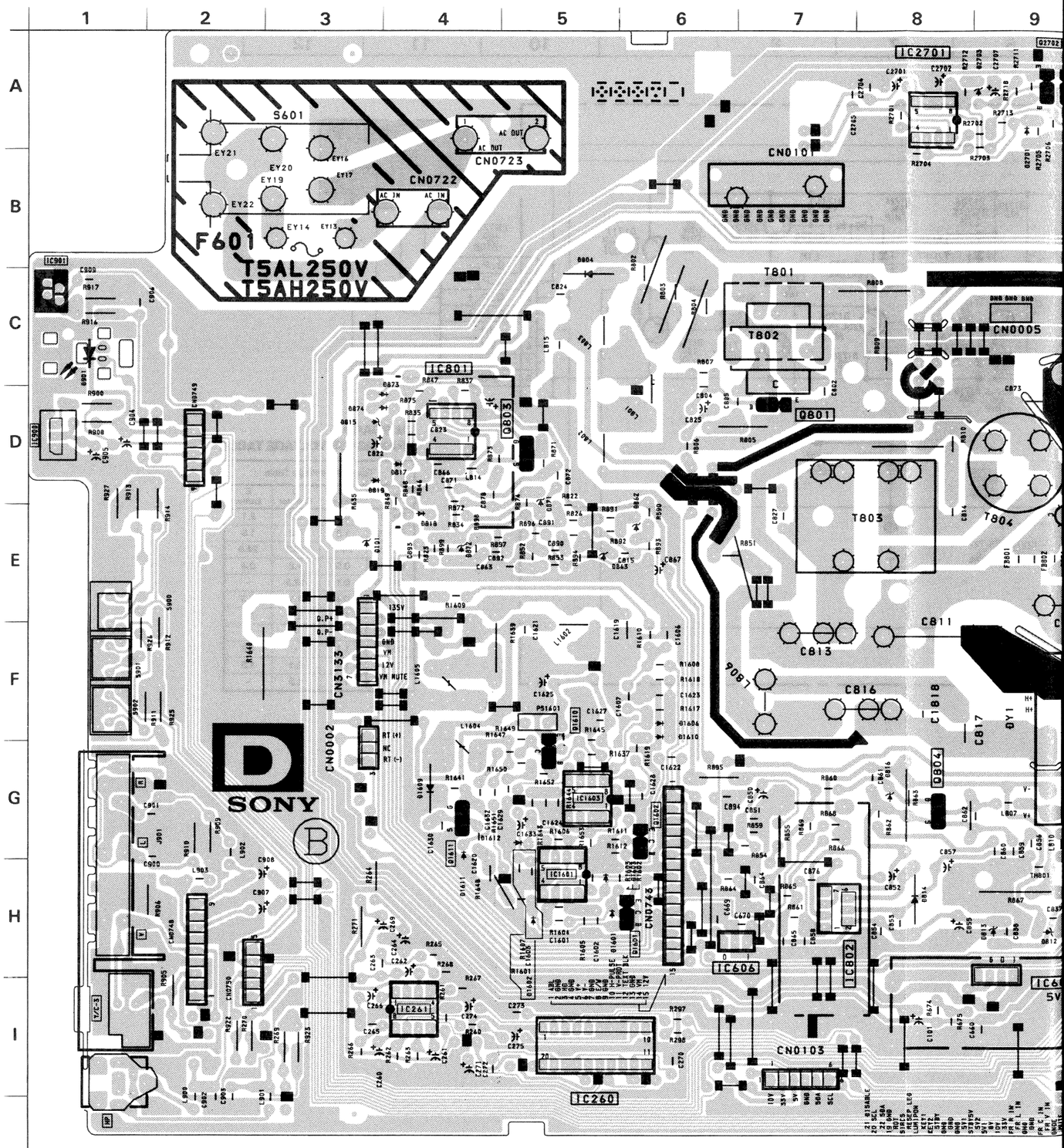
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

D BOARD

IC		DIODE	
IC236	H-13	D101	E-3
IC260	I-5	D236	G-14
IC261	I-4	D237	G-14
IC603	H-11	D238	G-14
IC604	H-9	D239	G-14
IC606	H-7	D262	H-13
IC607	G-10	D264	G-13
IC801	C-4	D276	I-12
IC802	H-8	D278	H-12
IC900	D-1	D279	H-12
IC2701	A-8	D280	G-13
TRANSISTOR		D281	H-12
Q276	H12	D282	G-12
Q277	H-13	D612	A-12
Q278	I-14	D613	B-12
Q279	I-14	D631	A-13
Q280	H-12	D632	A-14
Q281	G-12	D633	B-11
Q282	G-13	D802	F-10
Q606	B-11	D803	E-10
Q607	A-11	D804	B-5
Q613	A-13	D805	C-15
Q614	A-10	D806	C-15
Q616	A-11	D810	G-11
Q617	G-13	D811	F-12
Q618	A-11	D812	H-9
Q620	A-15	D813	H-9
Q624	A-15	D814	H-8
Q801	D-7	D815	D-3
Q802	C-10	D816	G-8
Q803	D-5	D817	D-4
Q804	G-8	D818	E-4
Q1610	F-5	D819	D-3
Q1611	G-4	D873	D-4
Q2701	A-9	D874	D-3
		D901	C-1
		D1609	G-4
		D1611	H-4
		D2701	A-9
		D2702	A-9

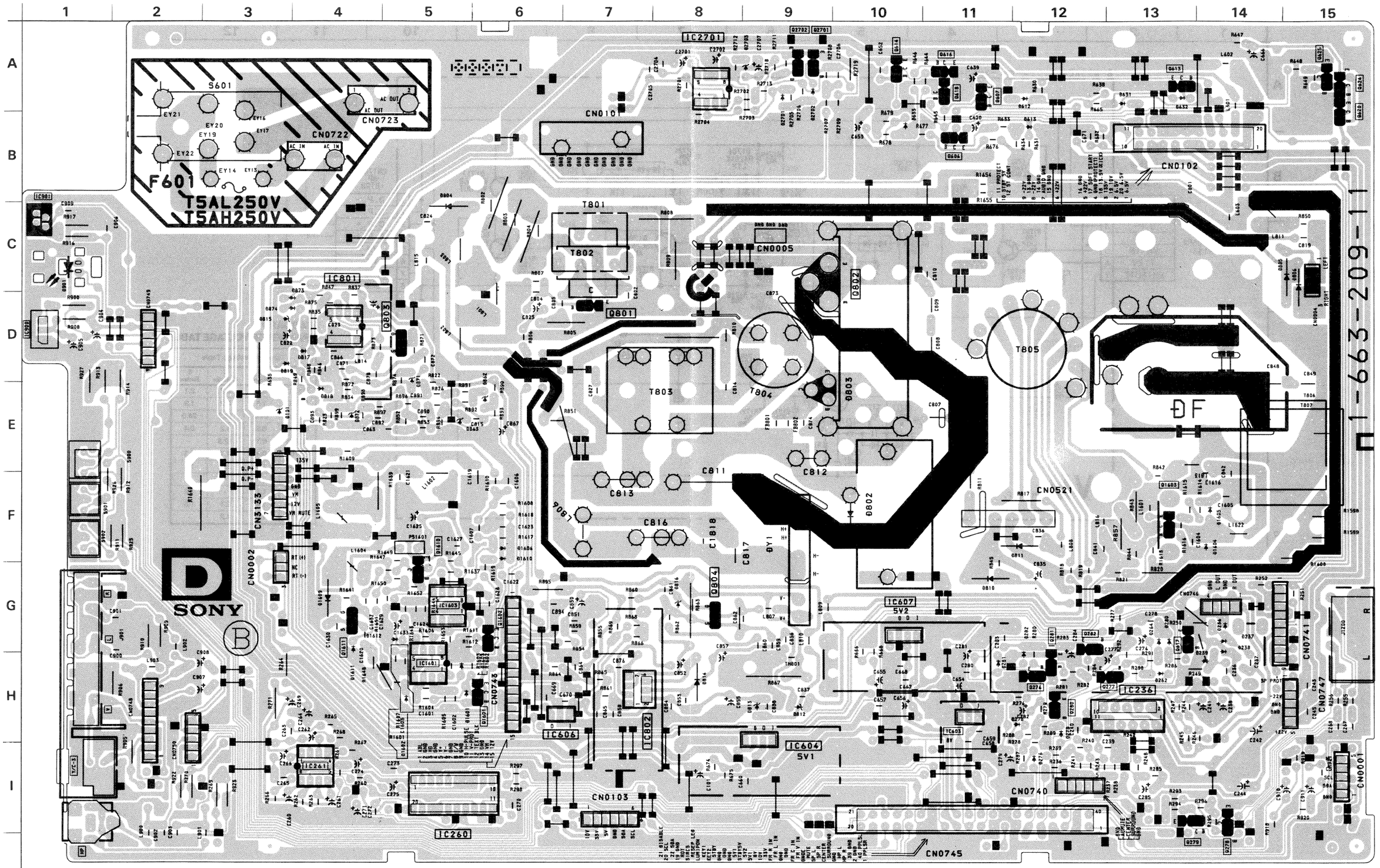
D HV OUT, PIN OU, POWER SUPPLY, CONTROL SW, AUDIO IN, Y-CHROMA IN, HEADPHONE IN, SIRCS RECEIVE, INDICATOR

D Board



D HV OUT, PIN OU, POWER SUPPLY, CONTROL SW, AUDIO IN, Y-CHROMA IN, HEADPHONE IN, SIRCS RECEIVE, INDICATOR

D Board



E
E-3
G-14
G-14
G-14
G-14
H-13
G-13
I-12
H-12
H-12
G-13
H-12
G-12
A-12
B-12
A-13
A-14
B-11
F-10
E-10
B-5
C-15
C-15
G-11
F-12
H-9
H-9
H-8
D-3
G-8
D-4
E-4
D-3
D-4
D-3
C-1
G-4
H-4
A-9
A-9

1 2 3 4 5 6 7 8 9 10 11

A B C D E F G H I J K L M N O

TO A (1/2) BOA
CN101

TO T BOARD
CN5002

CN0103
6P
+10V
+33V
5V1
GND
SDA
SCL

FOR SERVICE

CN0001
5P
RED-L
:S-MICRO
GND
SCL
SDA
DISABLE
NC

CN0745
40P
WHT
:BTOB-S
DISABLE
SCL
SDA
GND
ROT
SIRCS
RESP LED
LUMIPON
KEY1
KEY2
STBY
GND
GND
GND
5V1
STBY5V
5V2
5V1
8V
10V
33V
FR R IN
FR L IN

B-#SSAE4.<...>-D..-28WS4

CN0722
2P
GRY
:VH
AC IN
AC IN
AC IN
F601
T5A250V
LBC
POWER
S601

CN0723
2P
AC OUT
AC OUT

TO G BOARD
CN0703

D
AC IN,
HV OUT, PIN OUT
ROTATION AMP
AUDIO/VIDEO IN,
HEADPHONE JACK
AUDIO OUT JACK
SIRCS RECEIVER
FUNCTION SWITCH

IC603
LM2940T-8.0
8V-REG
C654 47 25V
C659 0.1 :MPS
C658 0.1 :MPS

CN0101
10P
WHT
:S-MICRO
GND 10
GND 9
GND 8
GND 7
GND 6
GND 5
GND 4
GND 3
GND 2
GND 1

TO G BOARD
CN0701

R666 470
Q617
DTC114ESA
STBY SW

R668 JW 5MM
IC604
PQ05RF21
+5V REG
C657 0.1 :MPS
C660 0.082 :MPS
R675 JW 5MM

CN0102
20P
:BTOB
6.5V 1
6.5V 20
6.5V 2
10V 19
135V 3
13.5V (KICK) 18
GND (PROTECT) 4
SOFT START 17
+22V (AUDIO) 5
GND 16
+22V (AUDIO) 6
GND 15
GND (AUDIO) 7
GND 14
-22V (AUDIO) 8
GND 13
-22V (AUDIO) 9
ST CONT 12
STBY5V 10
PROTECT 11

TO G BOARD
CN0702

L602 10uH
C656 47 16V
C667 0.1
IC607
PQ05RF21
+5V REG
C668 0.1

L601 JW-5MM

Q607
DTA144ESA
PROTECT SW
R631 220K :RN
R632 1K
C671 0.1 :MPS
R634 470K
R645 270
R633 10K
C620 47 50V
Q606
2SC1740S
POWER ON SW
D613
1SS119

Q618
DTA144ESA
ST SW

C639 10 50V
R630 10K
R638 4.7K
D612
1SS119TD
R665 4.7K
D631
1SS119TD
D632
1SS119TD
Q613
DTC144ESA
PROTECT SW

Q616
DTC144ESA
PROT CONT
C646 68
C652 0.33 :MPS
Q614
DTA144ESA
PROT CONT
R644 4.7K
R2719 10 :RF

C2702 47 25V
C2701 10 50V
R2705 10K
R2706 10K
D2701
1SS119TD
D2702
1SS119TD
IC2701
M5216P
ROTATION AMP
R2703 22K
R2713 JW 5MM
R2701 22K
R2702 22K
R2704 22K
Q2701
2SC1740S
BUFFER
R2708 10K
R2707 JW 5MM
C2706 330P

CN0002
3P
BLK
:S-MICRO
ROT (+) 1
GND 2
ROT (-) 3
TO ROTATION COIL

L603 10uH
C801 33 160V :HR
R676 47K
R677 47K
D633
1SS119TD
C653 330 16V
R679 220
R678 2.2K

Q620
2SC1740S
SP PROT SW
R648 JW 5MM
R649 JW 5MM
C666 330 16V
R647 1.8K
Q624
2SC1740S
SP PROT SW

R925 10K
R911 4.7K
R912 2.2K
R926 10K
R913 4.7K
R914 2.2K
S902
S901
S900

R900 220
R908 47
C905 10 50V
IC900
SBX1981-51
REMOTE CONTROL
RECEIVER
D901
SLA-570KT3F
RES/STBY

C907 1 50V
C908 1 50V
L902 10uH
L903 10uH
C901 100P 500V
C900 100P 500V
R909 47K
R910 47K
R R L L V V
R L VIDEO Y/C
J901
FRONT AV

R923 120
R922 120
IC606
LM78L12ACZ
+12V REG
C669 0.1 :MPS
C670 0.1 :MPS
C903 0.022
C902 0.022
R901 1K
R902 1K
J900
HEADPHONES

CN0743
15P
WHT
:S-MICRO
ABL
GND

+10V
+33V
+8V
+5V
+22V
-22V
+6.5V
+13.5V
+135V
+12V
STBY +5V
STBY+5V
STBY
5V1
5V2
8V
10V
33V
L
R
VIDEO
HP R
HP L

TO A (1/2) BOARD
CN101

FOR SERVICE

CN0001
5P
RED-L
-MICRO

CN0745
40P
WHT
:BTOB-S

DISABLE
SCL
SDA
GND
ROT
SIRCS
RESP LED
LUMIPON
KEY1
KEY2
STBY
GND
GND
5V1
STBY5V
5V2
5V1
8V
10V
33V
FR R IN
FR L IN
GND
GND
FR C IN
FR V IN
GND
MUTE
SP L
SP R
CENTER
SURROUND
GND
HP L
HP R
GND
GND
P.PLS L
P.PLS R

TO K BOARD
CN0271

CN0740
5P
WHT
:S-MICRO

GND
AUMUTE
CENTRE
SURROUND
GND

P.PLS L
P.PLS R
SURR
CENT
SP L
SP R
HP R
HP L
VIDEO
R
L
C
STBY
5V1
5V2
8V
10V
33V

+8V
+10V
+33V
STBY +5V
+22V
-22V
+15V
-15V
+135V
+200V
+12V

AUDIO OUT (MAIN)

IC240
TDA7309
AUDIO SELECTOR

IC261
TDA2822M
HEADPHONES
AMP

Q276
DTC144ESA
STBY SW

Q280
2SC1740S
MUTE SW

Q281
2SC1740S
MUTE SW

Q282
2SC1740S
MUTE SW

Q278
2SC1740S
MUTE

Q279
2SC1740S
MUTE

Q277
JA101
POWER ON
MUTE

Q801
2SC2688-LK
H-OUT-DRIVE

Q802
2SC3997-CA
H-OUT

Q803
IRF620
S PIN DRIVE

Q804
IRF620
V OUT

IC801
LM393P
DI-MOD

IC802
STV9379
VERTICAL
DEFLECTION
BOOSTER
DRV-IN
VCC
FB-PLS
VEE
OUT-PUT
VCC (OUT)
REF-VOLT

IC606
LM78L12ACZ
+12V REG

D802
ERD08M-15
H-DAMP1

D803
ESAC39M
H-DAMP2

D804
ERC38-06
PIN-PROT

D811
RGP10GPKG23
200V-RECT

D812
D1NL20-TA
+15V-RECT

D813
D1NL20-TA
+15V-RECT

D814
GP08BPKG23
Y-PDMP-UP

D815
MTZJ9.1B

D816 MTZJ-15B

T801
HOT

T803
PMT

T804
HLT

T805
FBT

T806
DFT

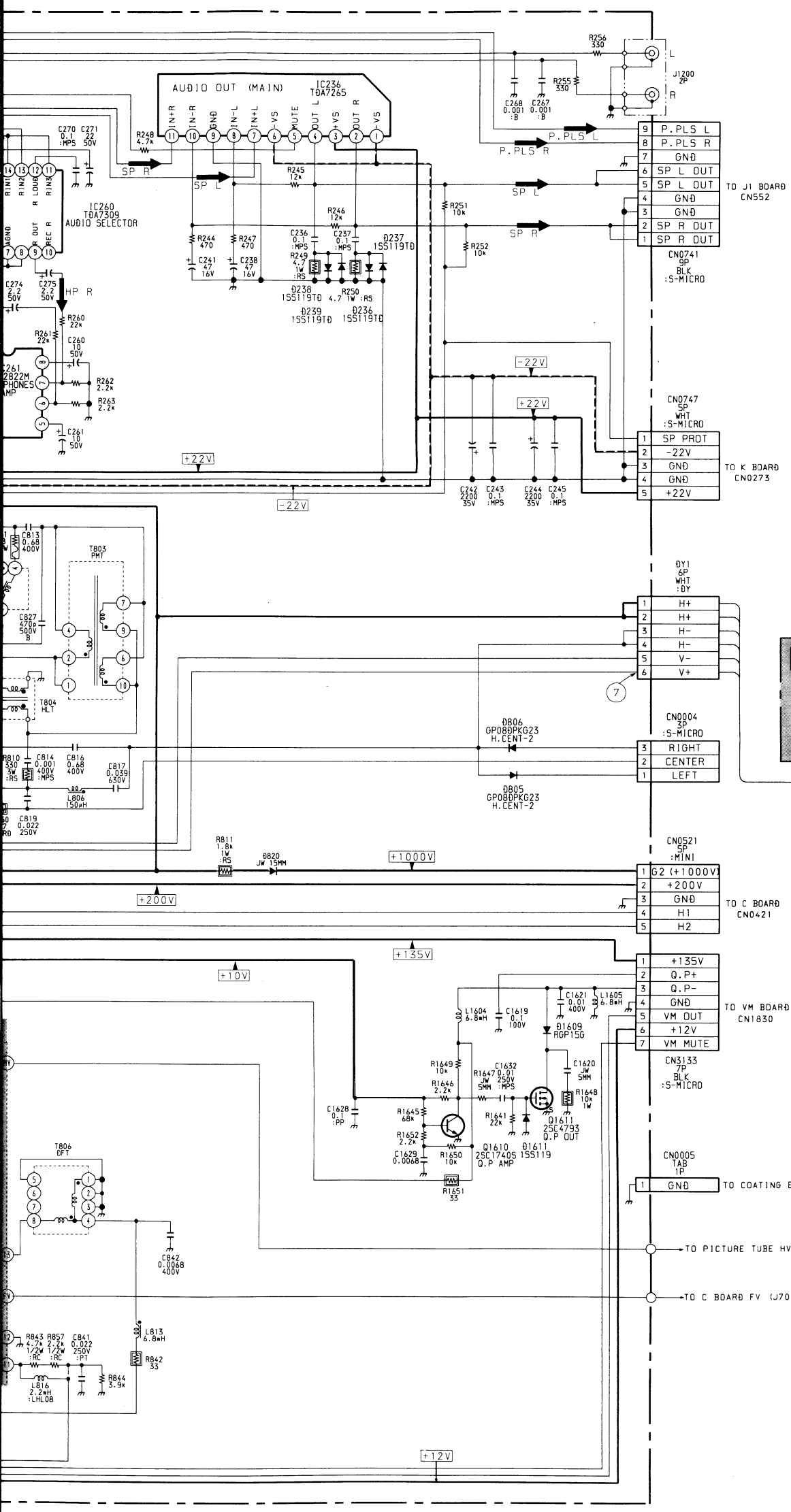
CN0743
15P
WHT
:S-MICRO

ABL
GND
HD
GND
V+
V-
GND
E/W
GND
H-PULSE
V-PROT
TEXT BLK
GND
VM
+12V

TO B (2/2) BOARD
CN417

J900
HEADPHONES

J901
FRONT AV
Y/C



WAVEFORMS D BOARD

① 3.5 Vp-p (2H)	② 210 Vp-p (2H)	③ 11 Vp-p (2H)
④ 1.1K Vp-p (2H)	⑤ 10 Vp-p (2H)	⑥ 62 Vp-p (2H)
⑦ 100 Vp-p (2H)		

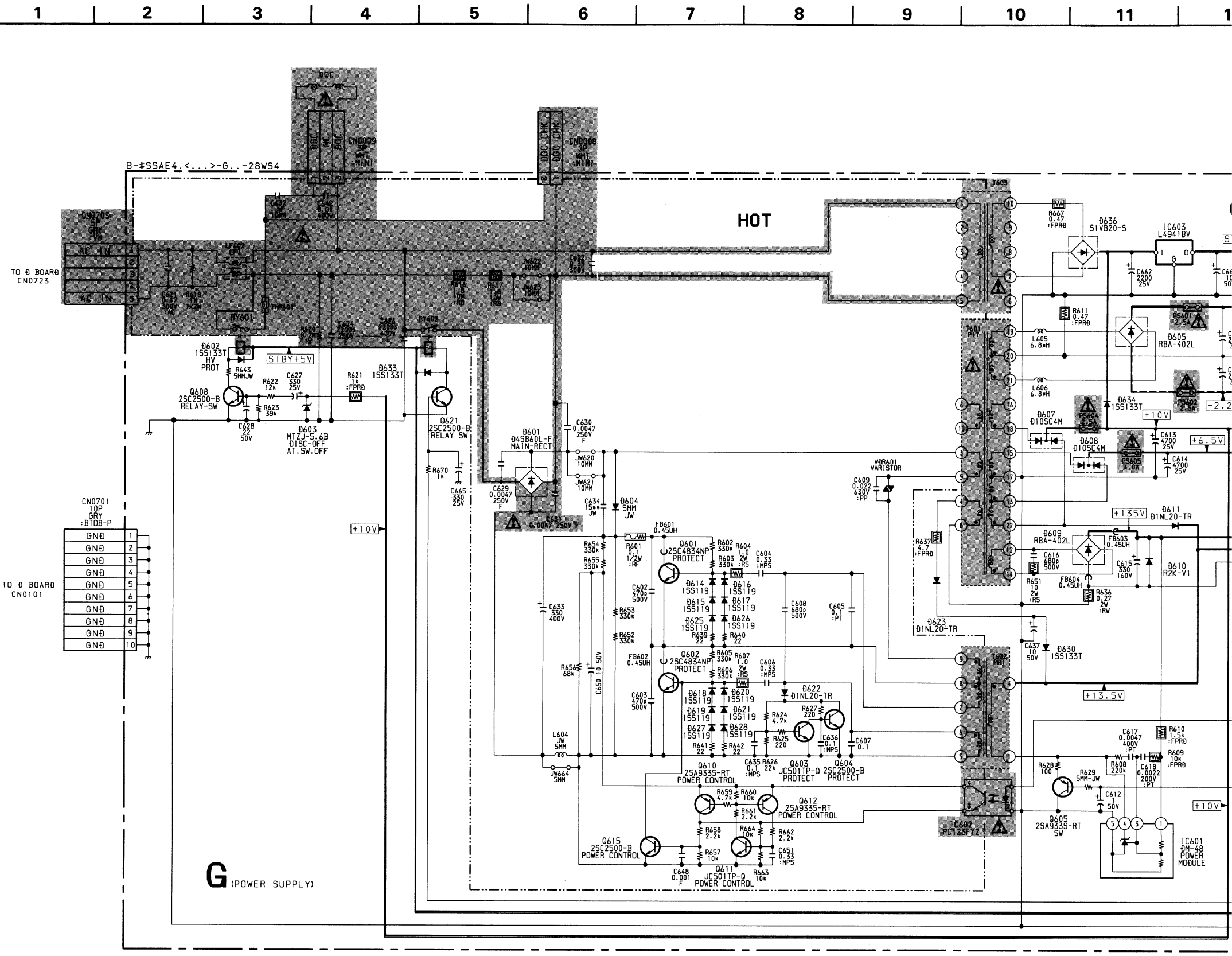
D BOARD TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table

Ref No	B Base	C Collector	E Emitter
Q276	0.7	4.0	-
Q277	10.0	-	9.7
Q278	-1.3	-	-
Q279	-1.3	-	-1.3
Q280	0.4	0.7	-
Q281	0.7	-	-
Q282	0.7	-	-
Q801	-1.0	101.0	-
Q802	-	136.0	-
Q803	9.0	15.0	-
Q804	11.3	0.1	-1.3
Q606	0.5	4.8	0.3
Q607	4.8	1.6	4.8
Q613	13.5	-	-
Q614	10.0	9.0	10.0
Q616	0.7	-	-
Q617	0.7	3.5	-
Q618	3.5	-	-
Q620	-	10.0	-
Q624	-	10.0	-
Q2701	-	2.3	-
Q1610	-0.5	2.2	-
Q1611	0.2	43.4	-

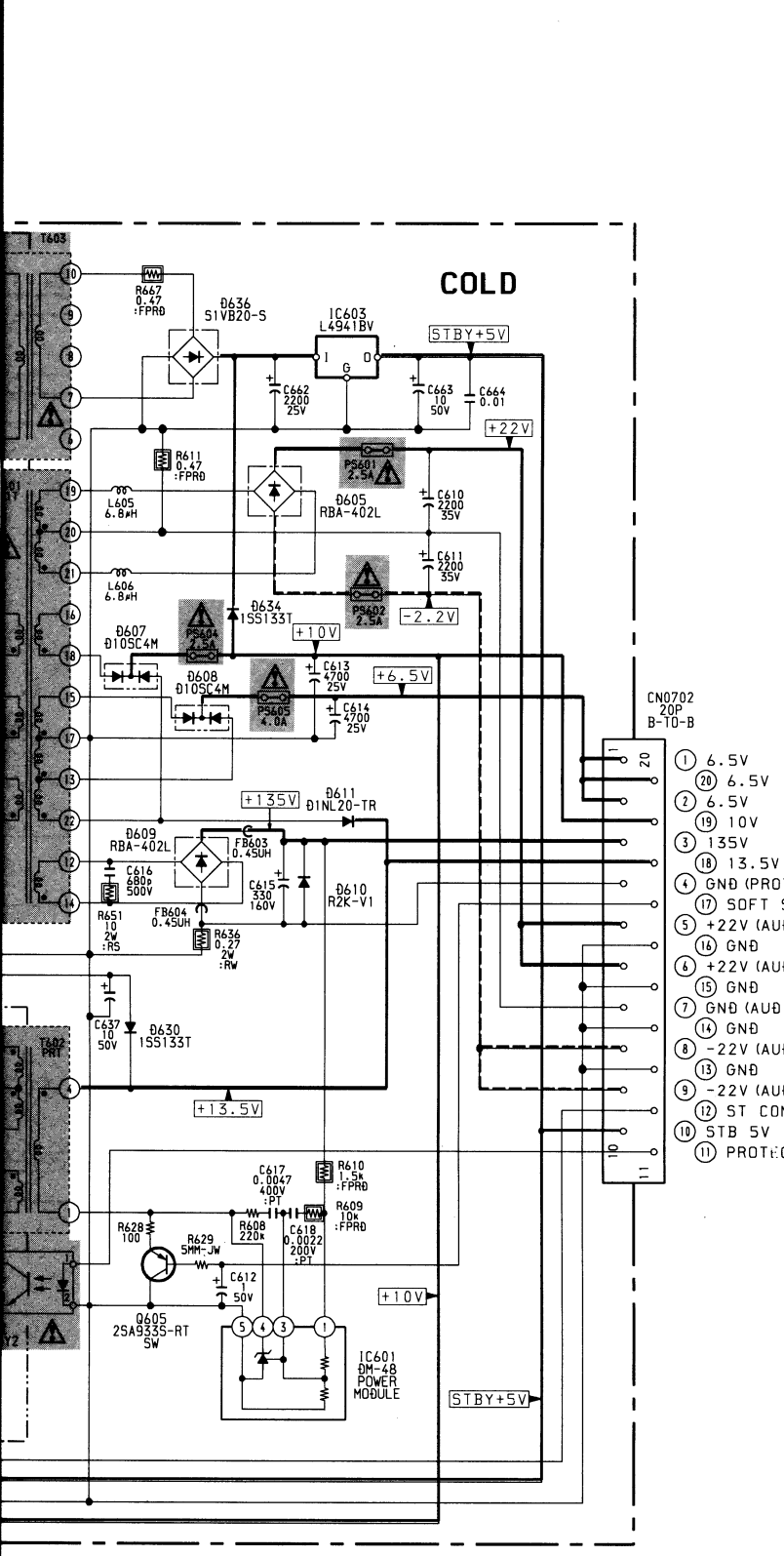
G BOARD
TRANSISTOR VOLTA

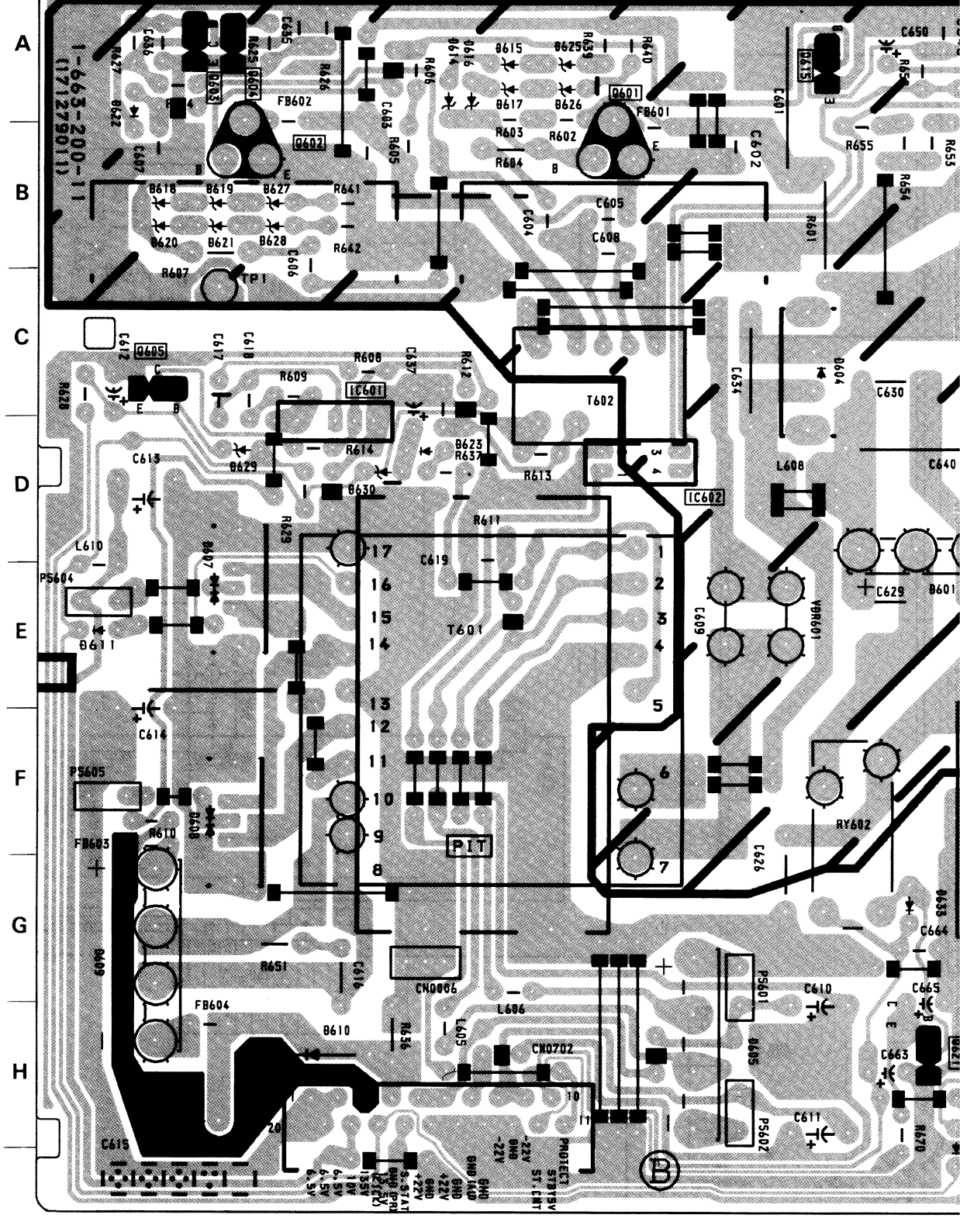
Transistor Voltage		
Ref No	B Base	C Collect
Q601	-1.6	-
Q602	0.2	293.(
Q603	0.6	0.1
Q604	0.1	1.4
Q605	0.1	11.(
Q608	-	4.8
Q610	22.0	-2.3
Q611	-1.6	26.6
Q612	26.7	-1.1
Q615	-2.6	-1.5
Q621	0.6	-

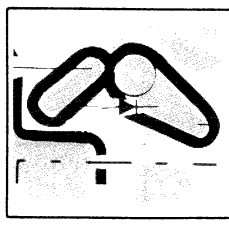


G BOARD
TRANSISTOR VOLTAGE TABLE

Transistor Voltage Table			
Ref No	B Base	C Collector	E Emitter
Q601	-1.6	-	-
Q602	0.2	293.0	-
Q603	0.6	0.1	-
Q604	0.1	1.4	-
Q605	0.1	11.0	-0.1
Q608	-	4.8	-0.1
Q610	22.0	-2.3	26.8
Q611	-1.6	26.6	-
Q612	26.7	-1.1	26.8
Q615	-2.6	-1.5	-
Q621	0.6	-	-0.1







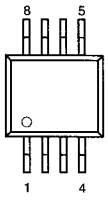
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

G BOARD

IC	
IC601	C-3
IC602	D-5
IC603	G-7
TRANSISTOR	
Q601	A-5
Q602	B-2
Q603	B-2
Q604	B-2
Q605	C-1
Q608	H-8
Q610	B-7
Q611	A-8
Q612	B-8
Q615	A-6
Q621	H-7
DIODE	
D601	E-7
D602	H-8
D603	H-8
D605	H-5
D607	E-2
D608	F-2
D609	G-1
D610	H-3
D611	E-1
D614	A-3
D615	A-4
D616	A-3
D617	A-4
D618	B-1
D619	B-2
D620	B-1
D621	B-2
D622	A-1
D623	D-3
D625	A-4
D626	A-4
D627	B-2
D628	B-2
D630	D-3
D633	G-7
D634	H-7
D636	G-8

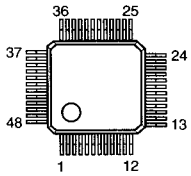
5-4. SEMICONDUCTORS

BA7046F
BA7046F-T1
MB3793-42PNF
MB3793-42PNF-ER
NJM2240M
NJM2240(TE2)



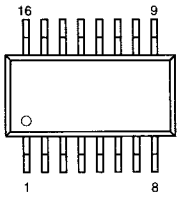
(TOP VIEW)

CXA1855Q-T6



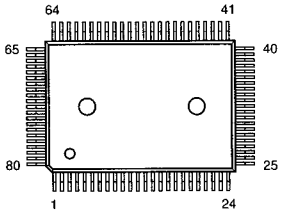
(TOP VIEW)

CXA1875AM-T4
HEF4053BT
MC14052BDR2
MC74F157ADR2
SN74LS33INS
74HCT4046AD



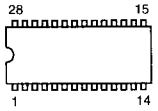
(TOP VIEW)

CXD2044Q
SAA4990H/V2



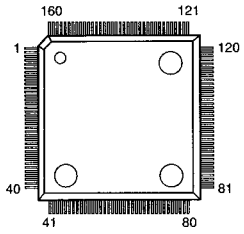
(MARKING SIDE VIEW)

CXD2053S
TDA4780/V3



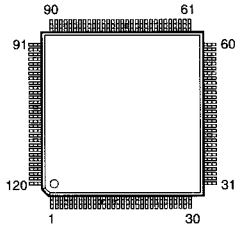
(TOP VIEW)

CXD8624Q



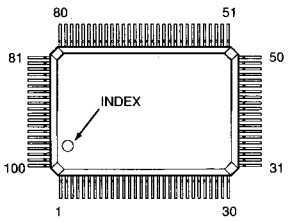
(TOP VIEW)

CXD8625Q



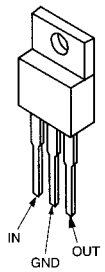
(TOP VIEW)

CXD8626Q

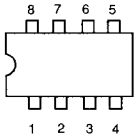


(TOP VIEW)

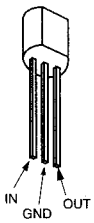
LM2940CT-9.0
LM2940T-8.0
L4941BV
TEA7605



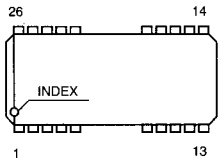
LM393P
M5216P
ST24C16FB6
TDA2822M
UPC393C



LM78L05ACZ
LM78L12ACZ
L78L05ACZ-AP
L78L12ACZ-AP

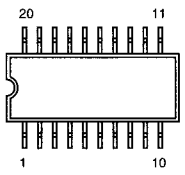


MB814400C-70PJN-ER



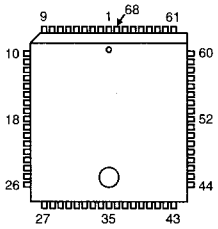
(TOP VIEW)

MC74F240DWR2



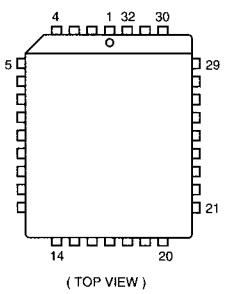
(TOP VIEW)

MSP3400C-PS-C6-T
MSP3410B-PS-F7-T-ND
SAA7185WP
SDA30C164-GEG
SDA5273P-C26-GEG
SDA5275



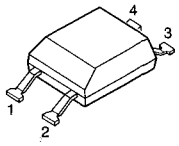
(TOP VIEW)

M27C4001-15C1-AE401

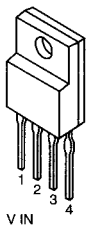


(TOP VIEW)

PC123F2
PC123FY2

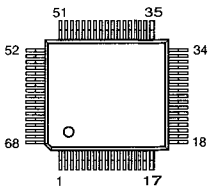


PQ05RF21



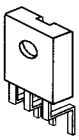
1 : V IN
2 : V OUT
3 : GND
4 : ON/OFF CONTROL

P83C654EBA/560
SDA9280A41

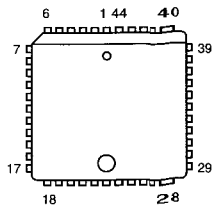


(TOP VIEW)

SBX1981-51

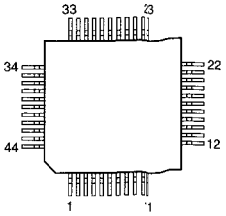


SAA4952WP/V1

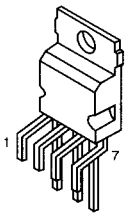


(TOP VIEW)

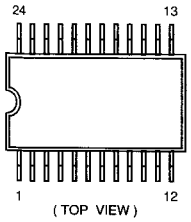
SDA9361



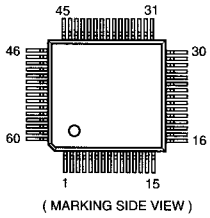
STV9379



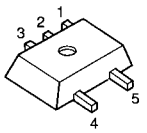
TC9293F-EL



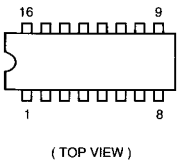
TC9337F-015



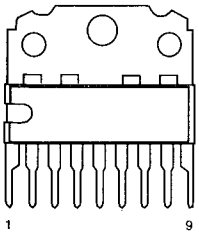
TC4S66F
TC4S66F-TE85L



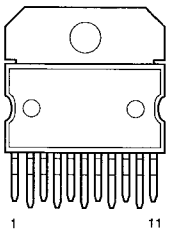
TDA4665T-T



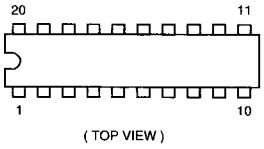
TDA6111Q
TDA6111Q/N4



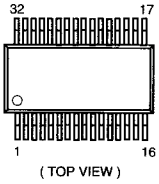
TDA7265



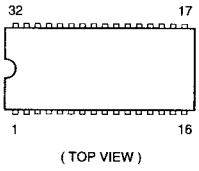
TDA7309



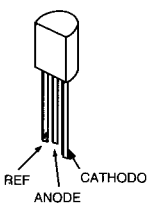
TDA8755T-T



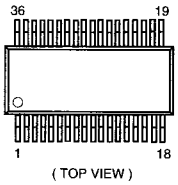
TDA9143/N2
TDA9144/N2
TDA9170T



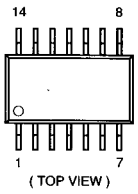
TL431CLP
TL431CLP-Z20
TL431CPS-T1
TL431CZ



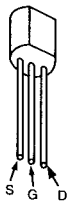
TMS4C2972-26DTR
TMS4C2972-28DTR



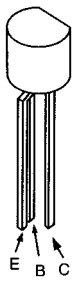
U2860B-BFPG3
74LVC08D



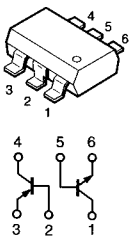
BC546B
BC556B



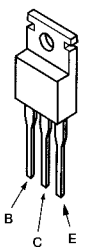
BF199-AMMO



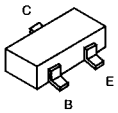
IMZ1A-T109



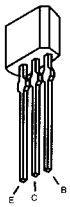
IRF620



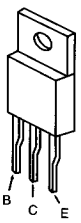
DTA114EK DTC144EK
DTA114EK-T146 DTC144EK-T146
DTA144EK DTC144EKA-T146
DTA144EK-T146 2SA1037K-T-146-R
DTC114EK 2SA1162-G
DTC114EKA-T146 2SC2412K-QR
DTC124EKA-T146 2SC2412K-T-146-R



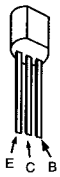
JA101TP-Q 2SA733-K
JC501TP-Q 2SA933AS-RT
DTA144ESA 2SA933AS-QRT
DTA144ESA-TP 2SA933S-RT
DTC144ESA-TP 2SC1740S-RT
2SA1175-HFE 2SC2785-HFE



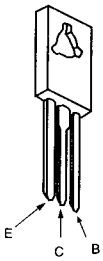
2SA1837



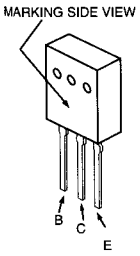
2SC2500-B
2SC2551-O
2SC2552O-TPE2



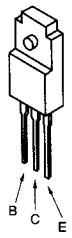
2SC2688-LK



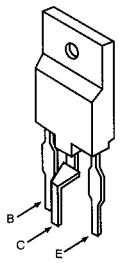
2SC3997CA



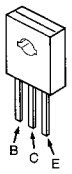
2SC4793



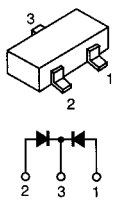
2SC4834NP-F09



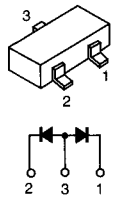
2SD2396H



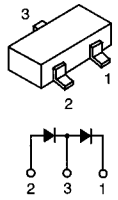
DAN202K
DAN202K-T-146



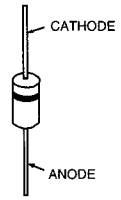
DAP202K
DAP202K-T-146



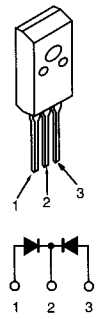
DA204K
DA204K-T-146



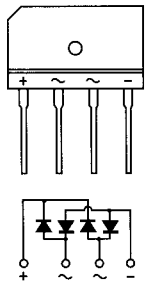
D1NL20
D1NL20-TA
D1NL20-TR
EGP20G
EL1Z
GP08D
GP08DPKG23
MTZJ-T-77-9.1
MTZJ-T-77-9.1A
R2K-V1
RGP02-20EG23
RGP02-20EL-6394
RGP10GPKG23
RGP15GPKG23
S2LA20F
1SS133T-77
1SS83
1SS83TD



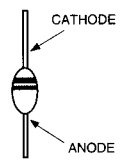
D10SC4M



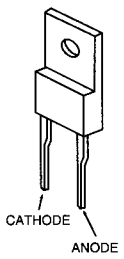
D4SB60L
D4SB60L-F
RBA-402L



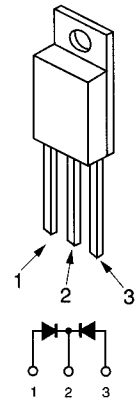
ERC38-06



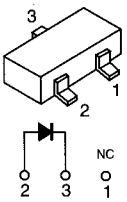
ERD08M-15



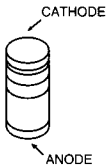
ESAD39M-06C
ESAD39M-06CF38



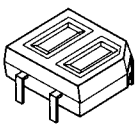
MA3033-L
MA3033L-TX
MA3056M-TX
MA3062M-TX
MA3030-H(TX)
RD5.6M-B2



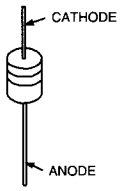
MA3051L-TX



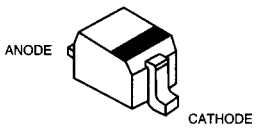
MA73-TX



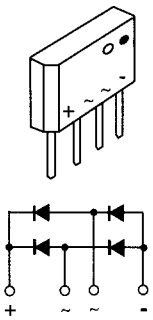
MTZJ-T-77-13B
MTZJ-T-77-15B
MTZJ-T-77-2.2A
MTZJ-T-77-33C
MTZJ-T-77-39C
MTZJ-T-77-5.6B
MTZJ-T-77-9.1B
MTZJ-13B
MTZJ-33C
MTZJ-39C
RD15ES-B2
RD5.6ESB2
RD9.1ESB2
1SS119-25
1SS119-25TD



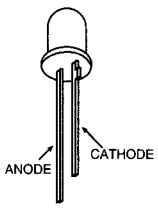
RD12SB2
UDZ-TE-17-12B



S1VB20-S
S1VB40

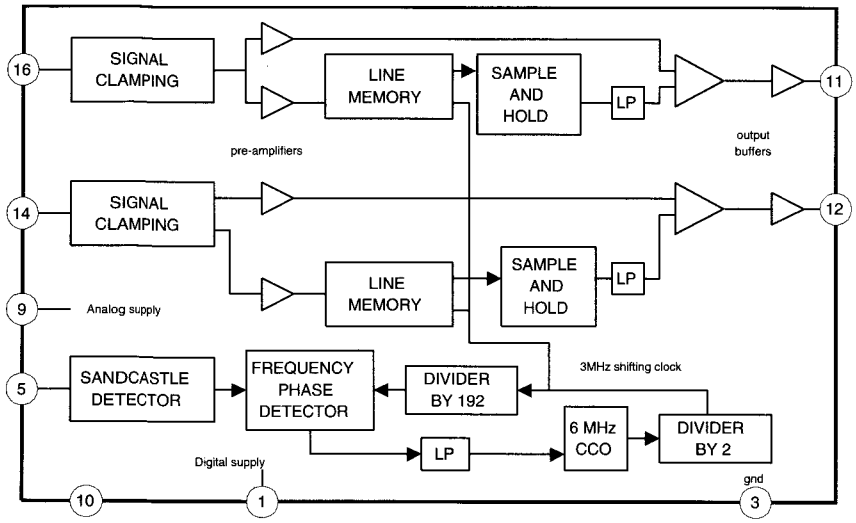


SLA-570KT3F

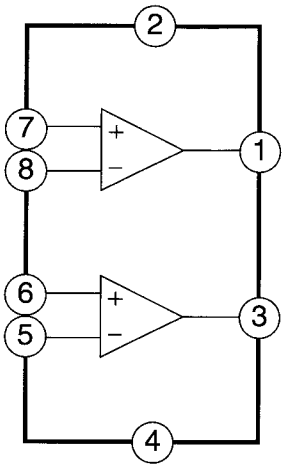


5-5. IC BLOCK DIAGRAMS

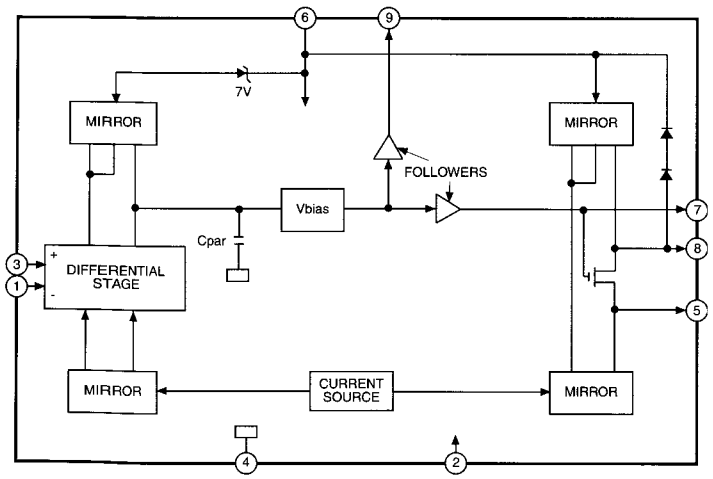
A Board IC303, TDA4665T-T



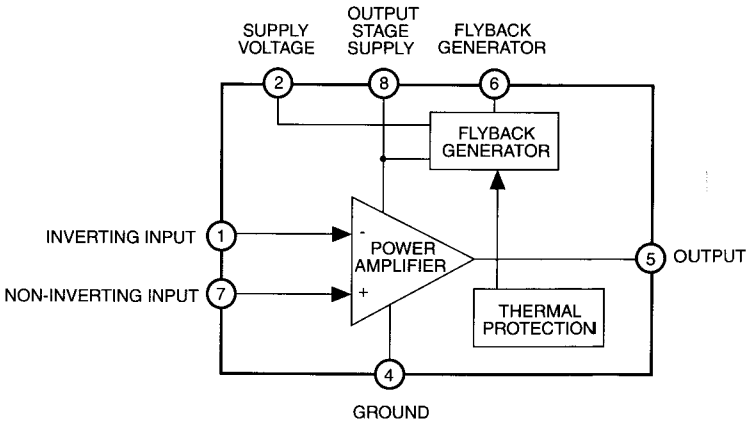
D Board IC261 TDA2822



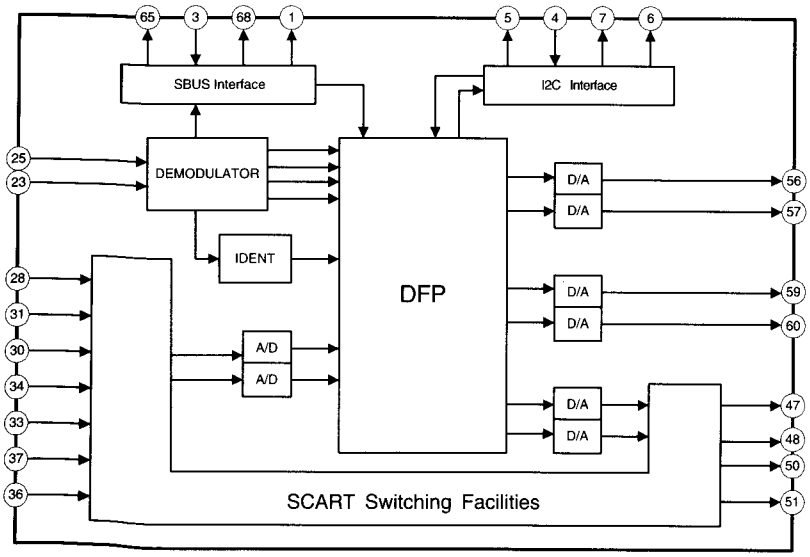
C Board IC703,704,705 TDA6111Q/N4



D Board IC802 STV9379



A Board IC201 MSP3400C-PS-C6-T/MSP3410B-PS-F7-T



SECTION 6
EXPLODED VIEWS

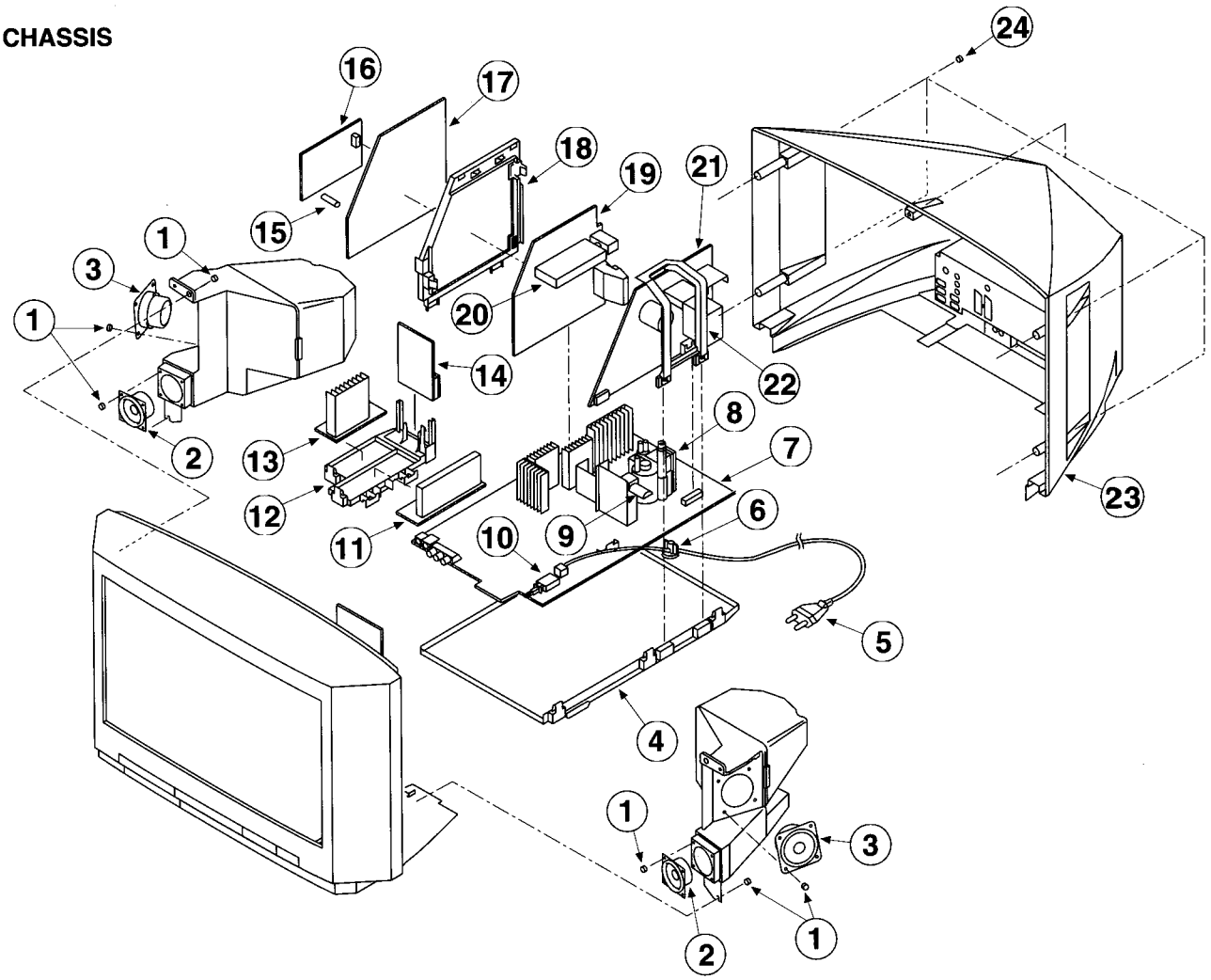
NOTE :

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remarks column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

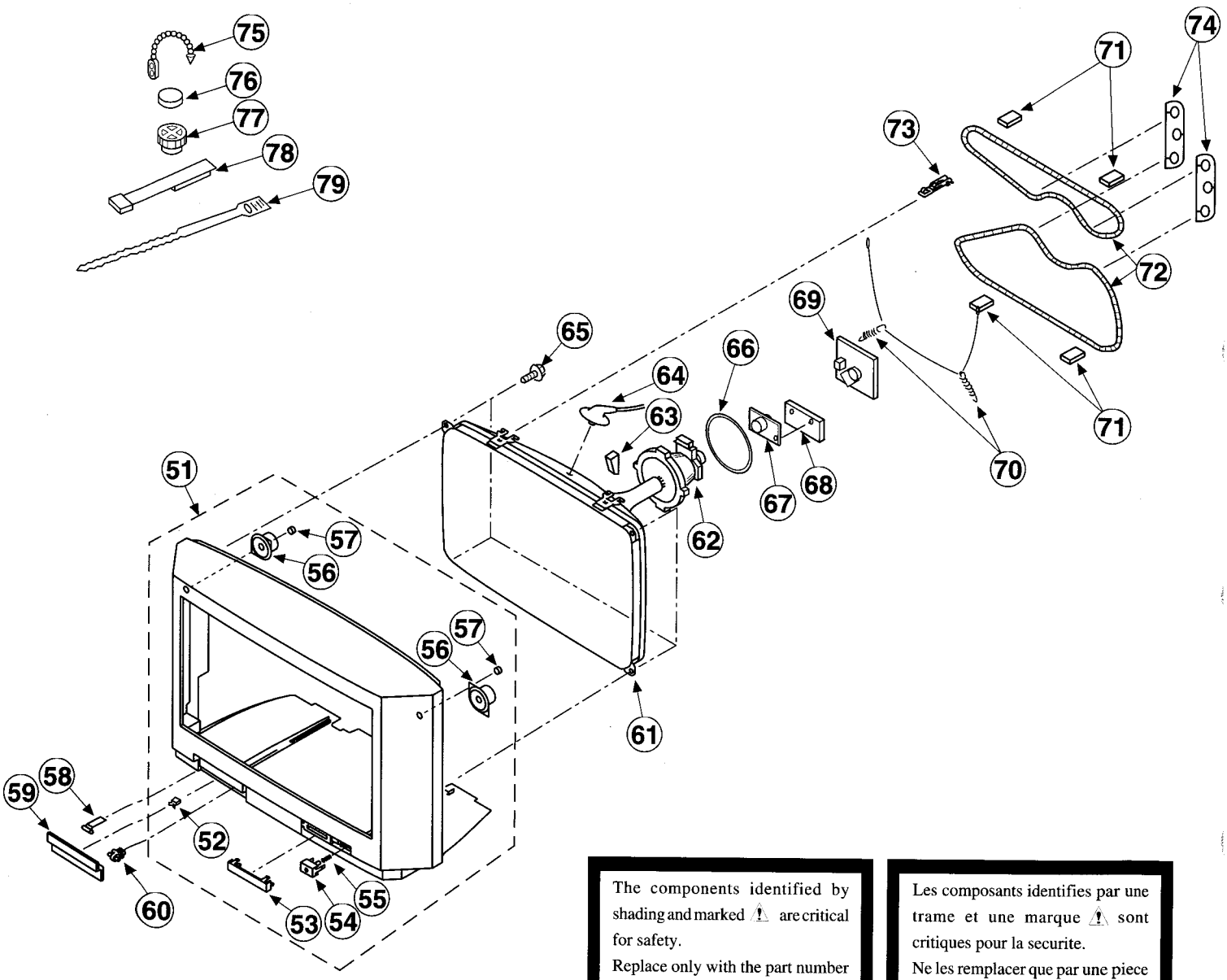
Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

6-1. CHASSIS



REF NO	PART NO	DESCRIPTION	REMARK
1	4-039-355-11	SCREW(4X12), (+) BV TAPPING	
2	1-505-154-11	SPEAKER (6.5CM)	
3	1-505-155-11	SPEAKER (10CM)	
4	*4-203-457-01	BRACKET, MAIN	
5	⚠ 1-751-680-11	CORD, POWER (WITH NOISE FILTER) 2.5A/250V	
6	⚠ *4-202-531-01	AC CORD LOCK (SC)	
7	*A-1640-244-A	D BOARD, COMPLETE	
8	⚠ 1-453-222-11	TRANSFORMER ASSY, FLYBACK (NX-4003/U2B4)	
9	*4-203-609-01	HOLDER, G	
10	⚠ 1-571-433-21	SWITCH, PUSH (AC POWER)	
11	*A-1652-042-A	T BOARD, COMPLETE (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
	*A-1652-044-A	T BOARD, COMPLETE (KV-28WS4B)	
12	*4-203-537-01	BRACKET, J-K-T	
13	*A-1649-015-A	K BOARD, COMPLETE	
14	*A-1651-083-A	J1 BOARD, COMPLETE (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
	*A-1651-089-A	J1 BOARD, COMPLETE (KV-28WS4B)	
15	*4-203-568-01	HOLDER, PCB (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
16	*A-1626-007-A	Q BOARD, COMPLETE (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
17	*A-1620-077-A	B BOARD, COMPLETE (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
	*A-1620-084-A	B BOARD, COMPLETE (KV-28WS4B)	
18	*4-203-612-01	BRACKET, A-B	
19	*A-1632-563-A	A BOARD, COMPLETE (KV-28WS4A)	
	*A-1632-562-A	A BOARD, COMPLETE (KV-28WS4B)	
	*A-1632-493-A	A BOARD, COMPLETE (KV-28WS4D)	
	*A-1632-564-A	A BOARD, COMPLETE (KV-28WS4E)	
	*A-1632-565-A	A BOARD, COMPLETE (KV-28WS4K)	
	*A-1632-566-A	A BOARD, COMPLETE (KV-28WS4R)	
20	1-693-338-21	TUNER/VIF (AEP) (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)	
	1-693-340-21	TUNER/VIF (FR) (KV-28WS4B)	
21	*A-1636-018-A	G BOARD, COMPLETE	
22	*4-203-613-01	SUPPORTER, G	
23	4-203-543-11	COVER, REAR	
24	4-039-358-01	SCREW (4X16), (+) BV TAPPING	

6-2. PICTURE TUBE



The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF NO	PART NO	DESCRIPTION	REMARK
51	A-1603-043-A	BEZNET ASSY	52-57
52	4-047-464-01	CATCHER PUSH	
53	4-203-539-01	WINDOW ORNAMENTAL	
54	4-203-540-01	BUTTON, POWER	
55	4-202-964-01	SPRING	
56	1-504-418-21	SPEAKER (5CM)	
57	4-039-356-01	SCREW(3X12), (+) BV TAPPING	
58	4-045-250-01	DAMPER	
59	4-203-542-01	DOOR, CONTROL	
60	4-202-555-01	SHAFT, DOOR	
	[illegible]	[illegible]	
	[illegible]	[illegible]	
63	3-704-495-01	SPACER, DY	
	[illegible]	[illegible]	
65	4-036-188-01	SCREW (M), PT	
66	1-452-724-22	COIL, NA ROTATION (RT-165)	

REF NO	PART NO	DESCRIPTION	REMARK
[illegible]	[illegible]	[illegible]	
68	*A-1644-075-A	VM BOARD, COMPLETE	
69	*A-1638-092-A	C BOARD, COMPLETE	
70	4-369-318-31	SPRING, TENSION	
71	*4-203-390-01	CUSHION, DGC	
[illegible]	[illegible]	[illegible]	
73	4-202-463-01	CLIP, DGC (25")	
74	*4-050-252-01	SPACER, DGC	
75	4-308-870-00	CLIP, LEAD WIRE	
76	1-452-032-00	MAGNET, DISK; 10MM Ø	
77	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
78	X-4387-214-1	PERMALLOY ASSY, CORRECTION	
79	3-701-007-00	BAND, BINDING	

SECTION 7
ELECTRICAL PARTS LIST

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

When indicating parts by reference number, please include the board name.

CAPACITORS MF : mF, PF : mmF

COILS MMH : mH, µH : mH

B

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*A-1620-077-A	B BOARD, COMPLETE (KV-28WS4A/28WS4D/			
		********** 28WS4E/28WS4K/			
		28WS4R)			
	*A-1620-084-A	B BOARD, COMPLETE (KV-28WS4B)			
		**********			
		< CAPACITOR >			
C407	1-126-969-11	ELECT 220MF	20%	50V	
C408	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C409	1-162-638-11	CERAMIC CHIP 1MF		16V	
C410	1-162-638-11	CERAMIC CHIP 1MF		16V	
C411	1-162-638-11	CERAMIC CHIP 1MF		16V	
C412	1-163-037-11	CERAMIC CHIP 0.022MF	10%	50V	
C413	1-163-037-11	CERAMIC CHIP 0.022MF	10%	50V	
C414	1-164-005-11	CERAMIC CHIP 0.47MF		25V	
C415	1-162-638-11	CERAMIC CHIP 1MF		16V	
C416	1-162-638-11	CERAMIC CHIP 1MF		16V	
C417	1-162-638-11	CERAMIC CHIP 1MF		16V	
C418	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C419	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C420	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C421	1-162-568-11	CERAMIC CHIP 0.33MF	10%	16V	
C422	1-162-638-11	CERAMIC CHIP 1MF		16V	
C427	1-126-963-11	ELECT 4.7MF	20%	50V	
C428	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C429	1-163-103-00	CERAMIC CHIP 27PF	5%	50V	
C430	1-163-103-00	CERAMIC CHIP 27PF	5%	50V	
C431	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C432	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C433	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C434	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	
C435	1-163-145-00	CERAMIC CHIP 0.0015MF	5%	50V	
C438	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C439	1-126-964-11	ELECT 10MF	20%	50V	
C440	1-126-964-11	ELECT 10MF	20%	50V	
C441	1-163-037-11	CERAMIC CHIP 0.022MF	10%	50V	
C443	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C444	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C445	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C446	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C449	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C450	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C451	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C452	1-163-103-00	CERAMIC CHIP 27PF	5%	50V	
C453	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C454	1-162-568-11	CERAMIC CHIP 0.33MF	10%	16V	
C455	1-126-964-11	ELECT 10MF	20%	50V	
C458	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C460	1-163-097-00	CERAMIC CHIP 15PF	5%	50V	
C1800	1-126-963-11	ELECT 4.7MF	20%	50V	
C1801	1-126-963-11	ELECT 4.7MF	20%	50V	
C1802	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V	
C1803	1-126-964-11	ELECT 10MF	20%	50V	
C1804	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1805	1-164-489-11	CERAMIC CHIP 0.22MF	10%	16V	
C1806	1-110-501-11	CERAMIC CHIP 0.33MF	10%	16V	
C1807	1-126-963-11	ELECT 4.7MF	20%	50V	
C1808	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C1809	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C1810	1-162-638-11	CERAMIC CHIP 1MF		16V	
C1811	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V	
C1812	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V	
C1813	1-164-489-11	CERAMIC CHIP 0.22MF	10%	16V	
C1814	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C1815	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C1816	1-126-963-11	ELECT 4.7MF	20%	50V	
C1817	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1818	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1819	1-163-097-00	CERAMIC CHIP 15PF	5%	50V	
C1823	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1824	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1825	1-126-964-11	ELECT 10MF	20%	50V	
C1826	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1827	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1828	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	
C1829	1-163-097-00	CERAMIC CHIP 15PF	5%	50V	
C1830	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1831	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C1832	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V	
C1833	1-126-964-11	ELECT 10MF	20%	50V	
C1834	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1835	1-164-489-11	CERAMIC CHIP 0.22MF	10%	16V	
C1836	1-110-501-11	CERAMIC CHIP 0.33MF	10%	16V	
C1839	1-126-963-11	ELECT 4.7MF	20%	50V	
C1840	1-162-638-11	CERAMIC CHIP 1MF		16V	
C1841	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V	
C1842	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V	
C1843	1-164-489-11	CERAMIC CHIP 0.22MF	10%	16V	
C1846	1-126-963-11	ELECT 4.7MF	20%	50V	
C1847	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C1848	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	

B

REF.NO.	PART NO.	DESCRIPTION		REMARK
C1849	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C1850	1-163-107-00	CERAMIC CHIP 39PF	5%	50V
C1851	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C1852	1-164-005-11	CERAMIC CHIP 0.47MF		16V
C1853	1-163-121-00	CERAMIC CHIP 150PF	5%	50V
C1854	1-164-005-11	CERAMIC CHIP 0.47MF		16V
C1855	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C1856	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C1857	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C1858	1-163-989-11	CERAMIC CHIP 0.033MF	10%	25V
C1859	1-164-005-11	CERAMIC CHIP 0.47MF		16V
C1860	1-126-961-11	ELECT 2.2MF	20%	50V
C1861	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C1862	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C1864	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C1865	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1866	1-126-964-11	ELECT 10MF	20%	50V
C1867	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1868	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1869	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1870	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1871	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1872	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1873	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1874	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1875	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1876	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C1877	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C1878	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1879	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1880	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1881	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1882	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1883	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1884	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1885	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1886	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1887	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1889	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1890	1-126-964-11	ELECT 10MF	20%	50V
C1891	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1892	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1893	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1894	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1897	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1898	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1899	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C1903	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1904	1-163-145-00	CERAMIC CHIP 0.0015MF	5%	50V
C1910	1-126-964-11	ELECT 10MF	20%	50V
C1912	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1921	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C1922	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C1924	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1925	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1926	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1927	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1928	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1931	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1932	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C1933	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C1935	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
JR426	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
R1824	1-164-049-11	CERAMIC 13PF	5%	50V
R1839	1-126-963-11	ELECT 4.7MF	20%	50V
		< CONNECTOR >		
CN412	*1-564-513-11	PLUG, CONNECTOR 10P		
CN413	*1-564-511-11	PLUG, CONNECTOR 8P		
CN417	*1-564-596-11	PLUG, CONNECTOR 15P		
CN419	*1-564-512-11	PLUG, CONNECTOR 9P		
CN1810	*1-564-512-11	PLUG, CONNECTOR 9P		
CN1813	1-778-822-11	CONNECTOR, BOARD TO BOARD 40P		
CN1815	*1-564-512-11	PLUG, CONNECTOR 9P		
		< DIODE >		
D401	8-719-914-43	DIODE DAN202K		
D402	8-719-914-43	DIODE DAN202K		
D403	8-719-028-00	DIODE MA3033L		
D410	8-719-401-63	DIODE MA3062M-TX		
D411	8-719-914-43	DIODE DAN202K		
D412	8-719-914-43	DIODE DAN202K		
D414	8-719-914-42	DIODE DA204K		
D415	8-719-914-43	DIODE DAN202K		
		< FERRITE BEAD >		
FB401	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB402	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB403	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB404	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB405	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB406	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB407	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1801	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1802	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1803	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1804	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1805	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1806	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1807	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1808	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1809	1-414-234-11	INDUCTOR, FERRITE BEAD		
FB1810	1-414-234-11	INDUCTOR, FERRITE BEAD		
		< ENCAPSULATED FILTER >		
FL1801	1-233-767-11	FILTER		
FL1803	1-415-940-11	DELAY LINE		
FL1807	1-236-071-11	ENCAPSULATED COMPONENT		
FL1808	1-236-071-11	ENCAPSULATED COMPONENT		
		< IC >		
IC402	8-759-275-36	IC TDA4780/V3		
IC403	8-759-421-42	IC SDA9361		
IC405	8-759-438-33	IC 74LVC08D		
IC406	8-759-439-64	IC HEF4053BT		
IC1801	8-759-257-59	IC TDA8755T-T		
IC1803	8-759-439-27	IC TMS4C2972-26DTR		
IC1804	8-759-439-64	IC HEF4053BT		
IC1805	8-759-439-64	IC HEF4053BT		

B

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1806	8-759-439-64	IC HEF4053BT	
IC1807	8-759-439-64	IC HEF4053BT	
IC1808	8-759-439-62	IC SAA4990H/V2	
IC1809	8-759-438-63	IC SDA9280A41	
IC1810	8-759-438-66	IC CXD8626Q	
IC1811	8-759-257-59	IC TDA8755T-T	
IC1812	8-759-426-57	IC 74HCT4046AD	
IC1813	8-759-426-57	IC 74HCT4046AD	
IC1814	8-759-438-64	IC SAA4952WP/V1	
IC1815	8-759-426-57	IC 74HCT4046AD	
IC1816	8-759-444-25	IC P83C654EBA/560	
IC1817	8-759-439-27	IC TMS4C2972-28DTR	
IC1819	8-759-991-41	IC LM78L05ACZ	
IC1821	8-759-439-64	IC HEF4053BT	
IC1822	8-759-439-64	IC HEF4053BT	
IC1823	8-759-991-41	IC LM78L05ACZ	
IC1824	8-759-991-41	IC LM78L05ACZ	
IC1825	8-759-234-77	IC TC4S66F-TE85L	
IC1831	8-759-907-81	IC SN74LS221NS	
		< COIL >	
L401	1-408-429-00	INDUCTOR 470UH	
L402	1-408-429-00	INDUCTOR 470UH	
L407	1-410-999-11	INDUCTOR CHIP 3.3UH	
L1801	1-410-435-21	INDUCTOR 220UH	
L1802	1-410-435-21	INDUCTOR 220UH	
L1803	1-408-403-00	INDUCTOR 3.3UH	
L1804	1-408-409-00	INDUCTOR 10UH	
L1805	1-410-999-11	INDUCTOR CHIP 3.3UH	
L1810	1-410-427-11	INDUCTOR 4.7UH	
L1811	1-408-403-00	INDUCTOR 3.3UH	
L1812	1-408-403-00	INDUCTOR 3.3UH	
L1813	1-408-403-00	INDUCTOR 3.3UH	
		< TRANSISTOR >	
Q411	8-729-901-06	TRANSISTOR DTA144EK	
Q412	8-729-901-06	TRANSISTOR DTA144EK	
Q415	8-729-900-53	TRANSISTOR DTC114EKA-T146	
Q416	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1801	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1802	8-729-901-01	TRANSISTOR DTC144EK	
Q1804	8-729-901-01	TRANSISTOR DTC144EK	
Q1805	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1807	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1808	8-729-901-01	TRANSISTOR DTC144EK	
Q1809	8-729-901-01	TRANSISTOR DTC144EK	
Q1810	8-729-901-01	TRANSISTOR DTC144EK	
Q1812	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1813	8-729-900-53	TRANSISTOR DTC114EKA	
		< RESISTOR >	
C1916	1-216-043-91	METAL GLAZE 560 5% 1/10W	
L1806	1-216-295-91	METAL GLAZE 0 5% 1/10W	
L1807	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR409	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR417	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR418	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR420	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR421	1-216-295-91	METAL GLAZE 0 5% 1/10W	

REF.NO.	PART NO.	DESCRIPTION	REMARK
JR422	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR423	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR424	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1801	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1802	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1803	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1804	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1805	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1806	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1807	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1808	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1809	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1810	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1811	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1812	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1840	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1841	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1843	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4B)
JR1859	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1860	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1861	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1862	1-216-043-91	METAL GLAZE 560 5% 1/10W	
JR1863	1-216-043-91	METAL GLAZE 560 5% 1/10W	
JR1864	1-216-043-91	METAL GLAZE 560 5% 1/10W	
JR1875	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1890	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1893	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
JR1894	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1896	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1897	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1898	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1899	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1901	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1904	1-216-029-00	METAL GLAZE 150 5% 1/10W	
JR1905	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1910	1-216-295-91	METAL GLAZE 0 5% 1/10W	
JR1911	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R408	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R409	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R439	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R443	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R444	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R445	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R446	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R447	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R448	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R449	1-216-049-91	METAL GLAZE 1K 5% 1/10W	

B

REF.NO.	PART NO.	DESCRIPTION			REMARK
R450	1-216-099-00	METAL GLAZE	120K	5%	1/10W
R451	1-216-101-00	METAL GLAZE	150K	5%	1/10W
R452	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R453	1-216-017-91	METAL GLAZE	47	5%	1/10W
R454	1-216-017-91	METAL GLAZE	47	5%	1/10W
R455	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R456	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R457	1-216-099-00	METAL GLAZE	120K	5%	1/10W
R458	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R459	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R463	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R465	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R466	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R467	1-216-041-00	METAL GLAZE	470	5%	1/10W
R468	1-216-025-91	METAL GLAZE	100	5%	1/10W
R469	1-216-025-91	METAL GLAZE	100	5%	1/10W
R470	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R473	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R477	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R483	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R484	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R492	1-216-027-00	METAL GLAZE	120	5%	1/10W
R1801	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R1802	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1803	1-216-296-91	METAL GLAZE	0	5%	1/8W
R1804	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R1805	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1806	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R1807	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1808	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1810	1-216-076-00	METAL GLAZE	13K	5%	1/10W
R1811	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1812	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1813	1-216-045-00	METAL GLAZE	680	5%	1/10W
R1814	1-216-031-00	METAL GLAZE	180	5%	1/10W
R1815	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1816	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1817	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1818	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1819	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1820	1-216-029-00	METAL GLAZE	150	5%	1/10W
R1821	1-216-023-00	METAL GLAZE	82	5%	1/10W
R1822	1-216-296-91	METAL GLAZE	0	5%	1/8W
R1823	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R1826	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R1827	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1828	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R1829	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1830	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1831	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R1832	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1833	1-216-041-00	METAL GLAZE	470	5%	1/10W
R1834	1-216-115-00	METAL GLAZE	560K	5%	1/10W
R1835	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1836	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1837	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1838	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R1840	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R1841	1-216-041-00	METAL GLAZE	470	5%	1/10W
R1842	1-216-115-00	METAL GLAZE	560K	5%	1/10W
R1843	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1844	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R1845	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1846	1-216-056-00	METAL GLAZE	2K	5%	1/10W
R1847	1-216-115-00	METAL GLAZE	560K	5%	1/10W
R1848	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1849	1-216-001-00	METAL GLAZE	10	5%	1/10W
R1850	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1851	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1852	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1853	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1854	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1855	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1856	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1857	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1858	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1859	1-216-017-91	METAL GLAZE	47	5%	1/10W
R1860	1-216-001-00	METAL GLAZE	10	5%	1/10W
R1861	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1864	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R1865	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1866	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1867	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R1868	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1869	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1870	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1871	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R1872	1-216-031-00	METAL GLAZE	180	5%	1/10W
R1873	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1874	1-216-031-00	METAL GLAZE	180	5%	1/10W
R1875	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1876	1-216-031-00	METAL GLAZE	180	5%	1/10W
R1877	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1878	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1879	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1880	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R1881	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1882	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R1885	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1886	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1888	1-216-021-00	METAL GLAZE	68	5%	1/10W
R1890	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1891	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1892	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1893	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1894	1-216-047-91	METAL GLAZE	820	5%	1/10W
R1895	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1896	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R1897	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1898	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1899	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R1900	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1901	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1902	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1903	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1904	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1905	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1906	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1907	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1908	1-216-097-91	METAL GLAZE	100K	5%	1/10W

B Q

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1909	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R1910	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R1911	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R1912	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R1914	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R1915	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W	
R1920	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R1921	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R1922	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R1923	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R1924	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R1930	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R1931	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R1932	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R1933	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
		< CRYSTAL >				
X401	1-767-343-21	VIBRATOR, CRYSTAL (24.576MHz)				
X1801	1-579-175-11	VIBRATOR, CERAMIC (10MHz)				

****

*A-1626-007-A Q BOARD, COMPLETE (KV-28WS4A/28WS4D/ 28WS4E/28WS4K/ 28WS4R)

< CAPACITOR >

C1	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C2	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C4	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C6	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C7	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C8	1-104-664-11	ELECT 47MF	20%	16V	
C9	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C10	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C11	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C12	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C13	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C14	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C15	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C16	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C20	1-163-077-00	CERAMIC CHIP 0.1MF		50V	
C21	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C22	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C23	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C24	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C25	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C26	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C27	1-126-965-11	ELECT 22MF	20%	50V	
C28	1-126-941-11	ELECT 470MF	20%	16V	
C29	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C33	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C34	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C36	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V	
C37	1-124-120-11	ELECT 220MF	20%	16V	
C38	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C39	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C40	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C41	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C42	1-165-319-11	CERAMIC CHIP 0.1MF		50V	
C43	1-165-319-11	CERAMIC CHIP 0.1MF		50V	
C44	1-165-319-11	CERAMIC CHIP 0.1MF		50V	
C45	1-165-319-11	CERAMIC CHIP 0.1MF		50V	
C46	1-165-319-11	CERAMIC CHIP 0.1MF		50V	
C47	1-165-319-11	CERAMIC CHIP 0.1MF		50V	

< CONNECTOR >

CN1	1-778-823-11	CONNECTOR, BOARD TO BOARD 40P
CN3	*1-564-520-11	PLUG, CONNECTOR 5P

< IC >

IC1	8-759-432-35	IC MC74F240DWR2
IC2	8-759-432-94	IC CXD8625Q
IC3	8-759-432-95	IC CXD8624Q
IC4	8-759-439-27	IC TMS4C2972-28DTR
IC5	8-759-432-96	IC MC74F157ADR2
IC6	8-759-439-27	IC TMS4C2972-28DTR
IC7	8-759-376-88	IC SAA7185WP
IC8	8-759-908-15	IC TL431CLP
IC9	8-759-432-96	IC MC74F157ADR2
IC10	8-759-432-96	IC MC74F157ADR2
IC11	8-759-432-96	IC MC74F157ADR2
IC12	8-759-432-96	IC MC74F157ADR2

< COIL >

L1	1-408-409-00	INDUCTOR	10UH
L3	1-408-409-00	INDUCTOR	10UH

< TRANSISTOR >

Q1	8-729-032-65	TRANSISTOR 2SD2396H

< RESISTOR >

C18	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1	1-216-025-91	METAL GLAZE	100	5%	1/10W
R2	1-216-025-91	METAL GLAZE	100	5%	1/10W
R5	1-216-295-91	METAL GLAZE	0	5%	1/10W
R6	1-216-295-91	METAL GLAZE	0	5%	1/10W
R7	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R8	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R9	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R10	1-216-295-91	METAL GLAZE	0	5%	1/10W
R11	1-216-295-91	METAL GLAZE	0	5%	1/10W
R12	1-216-295-91	METAL GLAZE	0	5%	1/10W
R14	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R15	1-216-295-91	METAL GLAZE	0	5%	1/10W
R17	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R18	1-216-077-00	METAL GLAZE	15K	5%	1/10W
R19	1-216-295-91	METAL GLAZE	0	5%	1/10W
R20	1-216-295-91	METAL GLAZE	0	5%	1/10W
R21	1-216-003-11	METAL GLAZE	12	5%	1/10W
R22	1-216-008-11	METAL GLAZE	20	5%	1/10W
R23	1-216-008-11	METAL GLAZE	20	5%	1/10W
R24	1-216-295-91	METAL GLAZE	0	5%	1/10W
R25	1-216-295-91	METAL GLAZE	0	5%	1/10W
R29	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R32	1-216-295-91	METAL GLAZE	0	5%	1/10W
R33	1-216-295-91	METAL GLAZE	0	5%	1/10W
R34	1-216-295-91	METAL GLAZE	0	5%	1/10W
R35	1-216-295-91	METAL GLAZE	0	5%	1/10W
R36	1-216-295-91	METAL GLAZE	0	5%	1/10W
R37	1-216-295-91	METAL GLAZE	0	5%	1/10W

Q A

REF.NO.	PART NO.	DESCRIPTION			REMARK
R38	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R39	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R40	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R41	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R42	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R43	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R44	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R45	1-216-013-00	METAL GLAZE	33	5% 1/10W	
R46	1-216-051-00	METAL GLAZE	1.2K	5% 1/10W	
R47	1-216-089-91	METAL GLAZE	47K	5% 1/10W	
R48	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R52	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R53	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R54	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R55	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R56	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R57	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R58	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R59	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R60	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R61	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R62	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R63	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R64	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R65	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R66	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R68	1-216-027-00	METAL GLAZE	120	5% 1/10W	
R69	1-216-001-00	METAL GLAZE	10	5% 1/10W	
R70	1-216-030-00	METAL GLAZE	160	5% 1/10W	
R71	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R87	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R89	1-216-001-00	METAL GLAZE	10	5% 1/10W	
R90	1-216-001-00	METAL GLAZE	10	5% 1/10W	
R91	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R92	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R93	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R94	1-216-295-91	METAL GLAZE	0	5% 1/10W	

****

*A-1632-563-A	A BOARD, COMPLETE (KV-28WS4A)	
	**********	
*A-1632-562-A	A BOARD, COMPLETE (KV-28WS4B)	
	**********	
*A-1632-493-A	A BOARD, COMPLETE (KV-28WS4D)	
	**********	
*A-1632-564-A	A BOARD, COMPLETE (KV-28WS4E)	
	**********	
*A-1632-565-A	A BOARD, COMPLETE (KV-28WS4K)	
	**********	
*A-1632-566-A	A BOARD, COMPLETE (KV-28WS4R)	
	**********	

< CAPACITOR >

C101	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C103	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (KV-28WS4B)
C105	1-126-965-11	ELECT	22MF	20%	50V
C111	1-124-907-11	ELECT	10MF	20%	50V
C112	1-164-346-11	CERAMIC CHIP	1MF		16V
C114	1-164-346-11	CERAMIC CHIP	1MF		16V
C116	1-104-664-11	ELECT	47MF	20%	16V
C117	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C118	1-104-664-11	ELECT	47MF	20%	16V
C119	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C120	1-124-907-11	ELECT	10MF	20%	50V
C121	1-164-299-11	CERAMIC CHIP	0.22MF	10%	25V
C122	1-164-346-11	CERAMIC CHIP	1MF		16V
C126	1-104-664-11	ELECT	47MF	20%	16V
C127	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C128	1-104-664-11	ELECT	47MF	20%	16V
C129	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C130	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C131	1-164-346-11	CERAMIC CHIP	1MF		16V
C132	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C133	1-164-346-11	CERAMIC CHIP	1MF		16V
C134	1-124-907-11	ELECT	10MF	20%	50V
C135	1-164-299-11	CERAMIC CHIP	0.22MF	10%	25V
C136	1-124-907-11	ELECT	10MF	20%	50V
C137	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C138	1-126-964-11	ELECT	10MF	20%	50V
C139	1-164-346-11	CERAMIC CHIP	1MF		16V
C140	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C141	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C143	1-163-113-00	CERAMIC CHIP	68PF	5%	50V (KV-28WS4B)
C144	1-163-237-11	CERAMIC CHIP	27PF	5%	50V (KV-28WS4B)
C145	1-163-113-00	CERAMIC CHIP	68PF	5%	50V (KV-28WS4B)
C146	1-164-346-11	CERAMIC CHIP	1MF		16V
C150	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C151	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C152	1-124-907-11	ELECT	10MF	20%	50V
C153	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C154	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C155	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C156	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C157	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C159	1-164-505-11	CERAMIC CHIP	2.2MF		16V
C160	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C162	1-164-346-11	CERAMIC CHIP	1MF		16V
C163	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C164	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C165	1-164-346-11	CERAMIC CHIP	1MF		16V
C166	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C167	1-164-222-11	CERAMIC CHIP	0.22MF		25V
C200	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C201	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C202	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C203	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C204	1-162-568-11	CERAMIC CHIP	0.33MF	10%	16V
C205	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C206	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C207	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C208	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C209	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C210	1-110-501-11	CERAMIC CHIP	0.33MF	10%	16V
C211	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C212	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C213	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C214	1-164-506-11	CERAMIC CHIP	4.7MF		16V
C215	1-164-506-11	CERAMIC CHIP	4.7MF		16V

REF.NO.	PART NO.	DESCRIPTION		REMARK
C216	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C217	1-124-907-11	ELECT 10MF	20%	50V
C218	1-124-907-11	ELECT 10MF	20%	50V
C219	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C220	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C221	1-163-275-11	CERAMIC CHIP 0.001MF	5%	50V
C222	1-163-275-11	CERAMIC CHIP 0.001MF	5%	50V
C223	1-163-275-11	CERAMIC CHIP 0.001MF	5%	50V
C224	1-163-275-11	CERAMIC CHIP 0.001MF	5%	50V
C227	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C228	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C229	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C230	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C231	1-163-087-00	CERAMIC CHIP 4PF	0.25PF	50V
C232	1-163-087-00	CERAMIC CHIP 4PF	0.25PF	50V
C233	1-163-243-11	CERAMIC CHIP 47PF	5%	50V
C234	1-163-243-11	CERAMIC CHIP 47PF	5%	50V
C303	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C304	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C305	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C306	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C307	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C308	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C309	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C310	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C311	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C312	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C313	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C314	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C315	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C316	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C317	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C318	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C319	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C320	1-165-320-11	CERAMIC CHIP 0.47MF	10%	16V
C321	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C322	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C323	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C324	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C325	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C332	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C333	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C334	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C335	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C336	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C337	1-162-568-11	CERAMIC CHIP 0.33MF	10%	16V
C338	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C339	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C340	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C341	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C342	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C343	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C344	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C345	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C346	1-164-505-11	CERAMIC CHIP 2.2MF		16V
C347	1-164-505-11	CERAMIC CHIP 2.2MF		16V
C350	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C351	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C355	1-163-231-11	CERAMIC CHIP 15PF	5%	50V
C356	1-163-231-11	CERAMIC CHIP 15PF	5%	50V
C357	1-163-241-11	CERAMIC CHIP 39PF	5%	50V
C1001	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1002	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1003	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1004	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1005	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1006	1-165-321-11	CERAMIC CHIP 0.68MF	10%	16V
C1007	1-164-344-11	CERAMIC CHIP 0.068MF	10%	25V
C1020	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1021	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1022	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1035	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1036	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1039	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1040	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C1041	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C1042	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C1043	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C1060	1-163-001-11	CERAMIC CHIP 220PF	10%	50V
C1101	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1102	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1103	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1104	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1105	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C1106	1-164-346-11	CERAMIC CHIP 1MF		16V
C1108	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C1109	1-163-037-11	CERAMIC CHIP 0.022MF	10%	50V
C1110	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1111	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1112	1-163-235-11	CERAMIC CHIP 22PF	5%	50V
C1113	1-163-235-11	CERAMIC CHIP 22PF	5%	50V
C1115	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C1116	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1201	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1202	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1203	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1204	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1205	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1206	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1207	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1208	1-163-263-11	CERAMIC CHIP 330PF	5%	50V
C1209	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1210	1-165-320-11	CERAMIC CHIP 0.47MF	10%	16V
C1213	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1214	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1215	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1216	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1217	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1218	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1219	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1220	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C1221	1-162-638-11	CERAMIC CHIP 1MF		16V
C1222	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1223	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C1224	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C1225	1-126-934-11	ELECT 220MF	20%	16V
C1227	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1228	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1229	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1230	1-163-245-11	CERAMIC CHIP 56PF	5%	50V

A

REF.NO.	PART NO.	DESCRIPTION		REMARK
C1231	1-163-245-11	CERAMIC CHIP 56PF	5%	50V
C1235	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1301	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1302	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1303	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1304	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1305	1-163-222-11	CERAMIC CHIP 5PF	0.25PF	50V
C1306	1-163-243-11	CERAMIC CHIP 47PF	5%	50V
C1310	1-124-443-00	ELECT 100MF	20%	10V
C1311	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1312	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1313	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1314	1-163-275-11	CERAMIC CHIP 0.001MF	5%	50V
C1315	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1316	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1318	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1320	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1321	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1322	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1323	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1324	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1325	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1326	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1327	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1328	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1329	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1330	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1331	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1332	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1333	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1334	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1335	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C1350	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C1360	1-163-005-11	CERAMIC CHIP 470PF	10%	50V
C1361	1-104-663-11	ELECT 33MF	20%	16V
C1401	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1402	1-163-231-11	CERAMIC CHIP 15PF	5%	50V
C1403	1-163-231-11	CERAMIC CHIP 15PF	5%	50V
C1404	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C1405	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1406	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1407	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1408	1-164-182-11	CERAMIC CHIP 0.0033MF	10%	50V
C1409	1-165-320-11	CERAMIC CHIP 0.47MF	10%	16V
C1413	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1414	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1415	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1416	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1417	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1418	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1419	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1420	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1421	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C1422	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C2001	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C2002	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C2004	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C2005	1-164-506-11	CERAMIC CHIP 4.7MF		16V
C2007	1-163-038-91	CERAMIC CHIP 0.1MF		25V
C2020	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C2021	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C2023	1-163-038-91	CERAMIC CHIP 0.1MF		25V
C2024	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C2025	1-163-235-11	CERAMIC CHIP 22PF	5%	50V
C2026	1-163-235-11	CERAMIC CHIP 22PF	5%	50V
C2028	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C2029	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C2030	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
C2031	1-164-222-11	CERAMIC CHIP 0.22MF		25V
C2033	1-163-251-11	CERAMIC CHIP 100PF	5%	50V
		< FILTER >		
CD1001	1-527-992-31	OSCILLATOR, CERAMIC (6MHz)		
CF200	1-409-327-00	TRAP, CERAMIC (6.5MHZ)		
		< CONNECTOR >		
CN101	1-695-301-11	CONNECTOR, BOARD TO BOARD 40P		
CN115	*1-564-524-11	PLUG, CONNECTOR 9P		
CN117	*1-564-520-11	PLUG, CONNECTOR 5P		
CN201	1-766-296-11	CONNECTOR, DUAL SCART		
CN1411	1-564-523-11	PLUG, CONNECTOR 8P		
CN1413	1-564-523-11	PLUG, CONNECTOR 8P		
CN2012	*1-564-525-11	PLUG, CONNECTOR 10P		
		< BOOSTER >		
CP101	1-251-372-11	BOOSTER, RF		
		< DIODE >		
D102	8-719-158-49	DIODE RD12SB2		
D103	8-719-158-49	DIODE RD12SB2		
D104	8-719-158-49	DIODE RD12SB2		
D105	8-719-158-49	DIODE RD12SB2		
D199	8-719-914-43	DIODE DAN202K		
D200	8-719-158-49	DIODE RD12SB2		
D201	8-719-158-49	DIODE RD12SB2		
D202	8-719-158-49	DIODE RD12SB2		
D203	8-719-158-49	DIODE RD12SB2		
D204	8-719-158-49	DIODE RD12SB2		
D205	8-719-158-49	DIODE RD12SB2		
D206	8-719-158-49	DIODE RD12SB2		
D207	8-719-158-49	DIODE RD12SB2		
D208	8-719-158-49	DIODE RD12SB2		
D209	8-719-158-49	DIODE RD12SB2		
D210	8-719-158-49	DIODE RD12SB2		
D211	8-719-158-49	DIODE RD12SB2		
D212	8-719-158-49	DIODE RD12SB2		
D213	8-719-158-49	DIODE RD12SB2		
D214	8-719-158-49	DIODE RD12SB2		
D215	8-719-158-49	DIODE RD12SB2		
D217	8-719-158-49	DIODE RD12SB2		
D218	8-719-158-49	DIODE RD12SB2		
D219	8-719-158-49	DIODE RD12SB2		
D220	8-719-158-49	DIODE RD12SB2		
D221	8-719-158-49	DIODE RD12SB2		
D223	8-719-158-49	DIODE RD12SB2		
D301	8-719-401-41	DIODE MA3051L-TX		
D1007	8-719-914-44	DIODE DAP202K		
D1008	8-719-914-43	DIODE DAN202K		

A

REF.NO.	PART NO.	DESCRIPTION	REMARK
D1009	8-719-105-91	DIODE RD5.6M-B2	
D1010	8-719-105-91	DIODE RD5.6M-B2	
D1401	8-719-401-41	DIODE MA3051L-TX	
D2001	8-719-036-58	DIODE MA3030-H(TX)	
		< FERRITE BEAD >	
FB101	1-414-235-11	INDUCTOR, FERRITE BEAD	
FB102	1-414-235-11	INDUCTOR, FERRITE BEAD	
		< ENCAPSULATED FILTER >	
FL102	1-236-071-11	ENCAPSULATED COMPONENT	
FL103	1-236-071-11	ENCAPSULATED COMPONENT	
FL200	1-236-071-11	ENCAPSULATED COMPONENT	
FL201	1-233-764-21	FILTER (SMD)	
FL202	1-236-071-11	ENCAPSULATED COMPONENT	
FL203	1-236-071-11	ENCAPSULATED COMPONENT	
FL302	1-236-071-11	ENCAPSULATED COMPONENT	
FL1001	1-236-071-11	ENCAPSULATED COMPONENT	
FL1002	1-236-071-11	ENCAPSULATED COMPONENT	
FL1101	1-236-071-11	ENCAPSULATED COMPONENT	
FL1102	1-236-071-11	ENCAPSULATED COMPONENT	
FL1201	1-236-071-11	ENCAPSULATED COMPONENT	
FL1202	1-236-071-11	ENCAPSULATED COMPONENT	
FL1203	1-236-071-11	ENCAPSULATED COMPONENT	
FL1204	1-236-071-11	ENCAPSULATED COMPONENT	
FL1301	1-236-071-11	ENCAPSULATED COMPONENT	
FL1302	1-236-071-11	ENCAPSULATED COMPONENT	
FL1303	1-236-071-11	ENCAPSULATED COMPONENT	
FL1304	1-233-766-21	FILTER (SMD)	
FL1305	1-233-768-21	FILTER (SMD)	
FL1310	1-233-765-21	FILTER	
FL1402	1-236-071-11	ENCAPSULATED COMPONENT	
FL2001	1-236-071-11	ENCAPSULATED COMPONENT	
FL2003	1-236-071-11	ENCAPSULATED COMPONENT	
		< IC >	
IC101	8-752-069-53	IC CXA1855Q-T6	
IC102	8-759-267-25	IC LM2940CT-9.0	
IC104	8-759-514-57	IC BA7046F	
IC201	8-759-376-56	IC MSP3400C-PS-C6-T-ND	(KV-28WS4A/28WS4D/28WS4K/28WS4R)
	8-759-437-33	IC MSP3410B-PS-F7-T-ND	(KV-28WS4B/28WS4E)
IC302	8-759-439-59	IC TDA9144/N2	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
	8-759-439-58	IC TDA9143/N2 (KV-28WS4B)	
IC303	8-759-288-85	IC TDA4665T-T	
IC304	8-759-439-60	IC TDA9170T	
IC1001	8-759-351-92	IC SDA30C164-GEG	
IC1002	8-759-439-66	IC M27C4001-15C1-AE401	
	1-750-797-11	SOCKET PLCC ; IC1002	
IC1003	8-759-378-21	IC ST24C16FB6	
IC1004	8-759-259-18	IC MB3793-42PNF	
IC1101	8-752-378-77	IC CXD2053S	
IC1201	8-759-439-65	IC TC9337F-015	
IC1202	8-759-264-22	IC TC9293F-EL	
IC1301	8-752-379-35	IC CXD2044Q-TL	
IC1302	8-759-711-62	IC NJM2240M	
IC1303	8-759-385-76	IC MC14052BDR2	
IC1401	8-759-439-58	IC TDA9143/N2	
IC1402	8-759-288-85	IC TDA4665T-T	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
IC2001	8-759-438-62	IC SDA5275	(KV-28WS4A/28WS4B/28WS4D/28WS4K/28WS4R)
	8-759-337-48	IC SDA5273P-C26-GEG (KV-28WS4E)	
IC2004	8-759-426-56	IC MB814400C-70PJN-ER	
		< COIL >	
L101	1-412-751-11	INDUCTOR 18UH (KV-28WS4B)	
L321	1-412-006-31	INDUCTOR CHIP 10UH	
		< TRANSISTOR >	
Q102	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q103	8-729-039-67	TRANSISTOR BSS83 (KV-28WS4B)	
Q104	8-729-920-74	TRANSISTOR 2SC2412K-QR (KV-28WS4B)	
Q105	8-729-901-01	TRANSISTOR DTC144EK	
Q106	8-729-216-22	TRANSISTOR 2SA1162-G (KV-28WS4B)	
Q107	8-729-216-22	TRANSISTOR 2SA1162-G	
Q108	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q110	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q112	8-729-216-22	TRANSISTOR 2SA1162-G	
Q120	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q200	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q205	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q301	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q302	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q315	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q316	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q317	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q318	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1001	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1004	8-729-900-53	TRANSISTOR DTC114EK	
Q1101	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1201	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q1202	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q1301	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1302	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1303	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1304	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1305	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1306	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1307	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1308	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1309	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1310	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1311	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1312	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1313	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1314	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1401	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q1402	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q1403	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q1404	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1411	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1412	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q2005	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q2006	8-729-027-59	TRANSISTOR DTC144EKA-T146	
Q2007	8-729-027-59	TRANSISTOR DTC144EKA-T146	

A

REF.NO.	PART NO.	DESCRIPTION			REMARK
		< RESISTOR >			
C1212	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1001	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1002	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1003	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1004	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1006	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1008	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1009	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1010	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1011	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1339	1-216-295-91	METAL GLAZE	0	5%	1/10W
JR1340	1-216-295-91	METAL GLAZE	0	5%	1/10W
R102	1-216-025-91	METAL GLAZE	100	5%	1/10W
R103	1-216-025-91	METAL GLAZE	100	5%	1/10W
R104	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R106	1-216-033-00	METAL GLAZE	220	5%	1/10W
R107	1-216-295-91	METAL GLAZE	0	5%	1/10W (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R108	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R109	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R110	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R111	1-216-041-00	METAL GLAZE	470	5%	1/10W
R112	1-216-041-00	METAL GLAZE	470	5%	1/10W
R113	1-216-041-00	METAL GLAZE	470	5%	1/10W
R114	1-216-311-00	METAL GLAZE	6.8	5%	1/10W
R115	1-216-311-00	METAL GLAZE	6.8	5%	1/10W
R116	1-216-311-00	METAL GLAZE	6.8	5%	1/10W
R117	1-216-022-00	METAL GLAZE	75	5%	1/10W
R118	1-216-022-00	METAL GLAZE	75	5%	1/10W
R119	1-216-022-00	METAL GLAZE	75	5%	1/10W
R120	1-216-022-00	METAL GLAZE	75	5%	1/10W
R121	1-216-022-00	METAL GLAZE	75	5%	1/10W
R122	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R123	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R124	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R126	1-216-039-00	METAL GLAZE	390	5%	1/10W
R127	1-216-039-00	METAL GLAZE	390	5%	1/10W
R128	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R129	1-208-774-11	METAL CHIP	470	0.50%	1/10W (KV-28WS4B)
R130	1-216-039-00	METAL GLAZE	390	5%	1/10W
R131	1-216-039-00	METAL GLAZE	390	5%	1/10W
R132	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R133	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R134	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R135	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R136	1-216-022-00	METAL GLAZE	75	5%	1/10W
R137	1-216-033-00	METAL GLAZE	220	5%	1/10W
R138	1-216-022-00	METAL GLAZE	75	5%	1/10W
R139	1-216-033-00	METAL GLAZE	220	5%	1/10W
R141	1-216-033-00	METAL GLAZE	220	5%	1/10W
R142	1-216-033-00	METAL GLAZE	220	5%	1/10W
R143	1-216-025-91	METAL GLAZE	100	5%	1/10W
R144	1-216-025-91	METAL GLAZE	100	5%	1/10W
R146	1-216-033-00	METAL GLAZE	220	5%	1/10W
R148	1-208-774-11	METAL CHIP	470	0.50%	1/10W (KV-28WS4B)
R149	1-216-073-00	METAL GLAZE	10K	5%	1/10W (KV-28WS4B)
R151	1-208-774-11	METAL CHIP	470	0.50%	1/10W (KV-28WS4B)
R152	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R153	1-216-311-00	METAL GLAZE	6.8	5%	1/10W
R154	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R155	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R156	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W (KV-28WS4B)
R157	1-216-025-91	METAL GLAZE	100	5%	1/10W (KV-28WS4B)
R159	1-216-304-11	METAL GLAZE	3.3	5%	1/10W
R160	1-216-039-00	METAL GLAZE	390	5%	1/10W
R162	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R163	1-216-039-00	METAL GLAZE	390	5%	1/10W
R166	1-216-039-00	METAL GLAZE	390	5%	1/10W
R167	1-216-039-00	METAL GLAZE	390	5%	1/10W
R168	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R169	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R170	1-216-021-00	METAL GLAZE	68	5%	1/10W
R171	1-216-021-00	METAL GLAZE	68	5%	1/10W
R172	1-216-021-00	METAL GLAZE	68	5%	1/10W
R173	1-216-021-00	METAL GLAZE	68	5%	1/10W
R175	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R176	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R177	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R178	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R179	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R180	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R181	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R182	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R183	1-216-033-00	METAL GLAZE	220	5%	1/10W
R184	1-216-033-00	METAL GLAZE	220	5%	1/10W
R185	1-216-033-00	METAL GLAZE	220	5%	1/10W
R186	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R187	1-216-107-00	METAL GLAZE	270K	5%	1/10W
R188	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R189	1-218-755-11	METAL CHIP	130K	0.50%	1/10W
R190	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R191	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R192	1-216-041-00	METAL GLAZE	470	5%	1/10W
R193	1-216-041-00	METAL GLAZE	470	5%	1/10W
R194	1-216-041-00	METAL GLAZE	470	5%	1/10W
R195	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R196	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R197	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R198	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R199	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R200	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R201	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R202	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R203	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R204	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R205	1-216-037-00	METAL GLAZE	330	5%	1/10W
R207	1-216-039-00	METAL GLAZE	390	5%	1/10W
R208	1-216-039-00	METAL GLAZE	390	5%	1/10W
R209	1-216-025-91	METAL GLAZE	100	5%	1/10W
R210	1-216-025-91	METAL GLAZE	100	5%	1/10W
R211	1-216-025-91	METAL GLAZE	100	5%	1/10W

REF.NO.	PART NO.	DESCRIPTION			REMARK
R212	1-216-025-91	METAL GLAZE	100	5%	1/10W
R213	1-216-025-91	METAL GLAZE	100	5%	1/10W
R214	1-216-025-91	METAL GLAZE	100	5%	1/10W
R215	1-216-025-91	METAL GLAZE	100	5%	1/10W
R272	1-216-295-91	METAL GLAZE	0	5%	1/10W
R311	1-216-095-00	METAL GLAZE	82K	5%	1/10W
R312	1-216-077-00	METAL GLAZE	15K	5%	1/10W
R313	1-216-025-91	METAL GLAZE	100	5%	1/10W
R314	1-216-033-00	METAL GLAZE	220	5%	1/10W
R315	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R317	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R330	1-216-041-00	METAL GLAZE	470	5%	1/10W
R331	1-216-041-00	METAL GLAZE	470	5%	1/10W
R332	1-216-041-00	METAL GLAZE	470	5%	1/10W
R333	1-216-041-00	METAL GLAZE	470	5%	1/10W
R334	1-216-041-00	METAL GLAZE	470	5%	1/10W
R335	1-216-041-00	METAL GLAZE	470	5%	1/10W
R336	1-216-041-00	METAL GLAZE	470	5%	1/10W
R337	1-216-041-00	METAL GLAZE	470	5%	1/10W
R338	1-216-041-00	METAL GLAZE	470	5%	1/10W
R340	1-216-025-91	METAL GLAZE	100	5%	1/10W
R341	1-216-025-91	METAL GLAZE	100	5%	1/10W
R342	1-216-025-91	METAL GLAZE	100	5%	1/10W
R343	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R345	1-216-025-91	METAL GLAZE	100	5%	1/10W
R351	1-216-037-00	METAL GLAZE	330	5%	1/10W
R352	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R353	1-216-041-00	METAL GLAZE	470	5%	1/10W
R374	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R375	1-216-308-00	METAL GLAZE	4.7	5%	1/10W
R1001	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1011	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1012	1-216-041-00	METAL GLAZE	470	5%	1/10W
R1030	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1033	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1034	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1036	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1037	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1038	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1039	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1040	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1041	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1042	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1043	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1044	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1045	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1046	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1047	1-216-009-00	METAL GLAZE	22	5%	1/10W
R1048	1-216-083-00	METAL GLAZE	27K	5%	1/10W
R1050	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1051	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1052	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1053	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1054	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1056	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1057	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1058	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1059	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1060	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1061	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1062	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1063	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1070	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1071	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1075	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1101	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1102	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1103	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1104	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1105	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1106	1-216-001-00	METAL GLAZE	10	5%	1/10W
R1107	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1108	1-216-013-00	METAL GLAZE	33	5%	1/10W
R1109	1-216-005-00	METAL GLAZE	15	5%	1/10W
R1110	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1111	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R1112	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1113	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1115	1-216-009-00	METAL GLAZE	22	5%	1/10W
R1201	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R1202	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1203	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1204	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1206	1-216-295-91	METAL GLAZE	0	5%	1/10W
R1208	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1209	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1210	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1211	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1212	1-216-017-91	METAL GLAZE	47	5%	1/10W
R1213	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1214	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1215	1-216-190-00	METAL GLAZE	470	5%	1/8W
R1220	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1221	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1222	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1223	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1224	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R1225	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1301	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1302	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R1303	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1304	1-216-037-00	METAL GLAZE	330	5%	1/10W
R1305	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1306	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1307	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R1308	1-216-017-91	METAL GLAZE	47	5%	1/10W
R1309	1-216-017-91	METAL GLAZE	47	5%	1/10W
R1310	1-216-039-00	METAL GLAZE	390	5%	1/10W
R1311	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R1319	1-216-043-91	METAL GLAZE	560	5%	1/10W
R1320	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R1321	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1325	1-216-009-00	METAL GLAZE	22	5%	1/10W
R1330	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R1331	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R1332	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R1333	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R1334	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1335	1-216-033-00	METAL GLAZE	220	5%	1/10W
R1336	1-208-784-11	METAL CHIP	1.2K	0.50%	1/10W

A G

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION			REMARK
R1337	1-216-666-11	METAL CHIP	4.3K	0.50% 1/10W	
R1338	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1339	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1340	1-216-037-00	METAL GLAZE	330	5% 1/10W	
R1341	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R1342	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R1344	1-216-037-00	METAL GLAZE	330	5% 1/10W	
R1346	1-216-065-00	METAL GLAZE	4.7K	5% 1/10W	
R1347	1-216-089-91	METAL GLAZE	47K	5% 1/10W	
R1348	1-216-073-00	METAL GLAZE	10K	5% 1/10W	
R1349	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R1350	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R1351	1-216-047-91	METAL GLAZE	820	5% 1/10W	
R1352	1-216-051-00	METAL GLAZE	1.2K	5% 1/10W	
R1353	1-216-047-91	METAL GLAZE	820	5% 1/10W	
R1354	1-216-051-00	METAL GLAZE	1.2K	5% 1/10W	
R1401	1-216-095-00	METAL GLAZE	82K	5% 1/10W	
R1402	1-216-077-00	METAL GLAZE	15K	5% 1/10W	
R1403	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R1404	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R1405	1-216-033-00	METAL GLAZE	220	5% 1/10W	
R1406	1-216-037-00	METAL GLAZE	330	5% 1/10W	
R1407	1-216-037-00	METAL GLAZE	330	5% 1/10W	
R1410	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1411	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1412	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1413	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1414	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1415	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1416	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1417	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1418	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R1426	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R1427	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R1428	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R1461	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R1462	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R1463	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R2001	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R2002	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R2020	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R2021	1-216-073-00	METAL GLAZE	10K	5% 1/10W	
R2022	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R2023	1-216-063-91	METAL GLAZE	3.9K	5% 1/10W	
R2024	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R2025	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R2026	1-216-025-91	METAL GLAZE	100	5% 1/10W	
R2027	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R2028	1-216-009-00	METAL GLAZE	22	5% 1/10W	
R2031	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R2032	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R2033	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R2034	1-216-295-91	METAL GLAZE	0	5% 1/10W	
R2035	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R2037	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R2040	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W	
R2041	1-216-025-91	METAL GLAZE	100	5% 1/10W	

REF.NO.	PART NO.	DESCRIPTION			REMARK
		< TUNER >			
TU101	1-693-338-21	TUNER/VIF (AEP) (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)			
	1-693-340-21	TUNER/VIF (FR) (KV-28WS4B)			
		< CRYSTAL >			
X200	1-760-628-11	VIBRATOR, CRYSTAL (18.432MHz)			
X301	1-567-505-11	OSCILLATOR, CRYSTAL (3.58MHz)			
X302	1-567-504-11	OSCILLATOR, CRYSTAL (4.43MHz)			
X1001	1-760-551-21	VIBRATOR, CERAMIC (20.48MHz)			
X1101	1-767-342-21	VIBRATOR, CRYSTAL (14.32MHz)			
X1401	1-567-505-11	OSCILLATOR, CRYSTAL (3.58MHz)			
X1402	1-567-504-11	OSCILLATOR, CRYSTAL (4.43MHz)			
**********					
	*A-1636-018-A	G BOARD,COMPLETE **********			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		< CAPACITOR >			
C602	1-165-127-11	CERAMIC	470PF	10% 500V	
C603	1-165-127-11	CERAMIC	470PF	10% 500V	
C604	1-136-171-00	FILM	0.33MF	5% 50V	
C605	1-137-399-11	FILM	0.1MF	5% 50V	
C606	1-136-171-00	FILM	0.33MF	5% 50V	
C607	1-137-399-11	FILM	0.1MF	5% 50V	
C608	1-164-625-11	CERAMIC	680PF	10% 500V	
C609	1-129-718-00	FILM	0.022MF	5% 630V	
C610	1-126-953-11	ELECT	2200MF	20% 35V	
C611	1-126-953-11	ELECT	2200MF	20% 35V	
C612	1-124-903-11	ELECT	1MF	20% 50V	
C613	1-128-548-11	ELECT	4700MF	20% 25V	
C614	1-128-548-11	ELECT	4700MF	20% 25V	
C615	1-110-626-11	ELECT	330MF	20% 160V	
C616	1-164-625-11	CERAMIC	680PF	10% 500V	
C617	1-136-559-11	MYLAR	0.0047MF	10% 400V	
C618	1-104-989-91	FILM	0.0022MF	5% 200V	
C621 ⚠	1-136-519-12	FILM	0.47MF	20% 300V	
C622 ⚠	1-136-518-12	FILM	0.33MF	20% 300V	
C624 ⚠	1-113-890-61	CERAMIC	0.0022MF	20% 250V	
C626 ⚠	1-164-503-61	CERAMIC	0.0022MF	20% 400V	
C627	1-126-940-11	ELECT	330MF	20% 25V	
C628	1-126-965-11	ELECT	22MF	20% 50V	
C629	1-162-599-12	CERAMIC	0.0047MF	250V	
C630	1-162-599-12	CERAMIC	0.0047MF	250V	
C631 ⚠	1-161-964-91	CERAMIC	0.0047MF	250V	
C633	1-125-555-11	ELECT	330MF	20% 400V	
C635	1-136-165-00	FILM	0.1MF	5% 50V	
C636	1-136-165-00	FILM	0.1MF	5% 50V	
C637	1-126-964-11	ELECT	10MF	20% 50V	
C642 ⚠	1-162-580-51	CERAMIC	0.01MF	400V	
C648	1-101-001-00	CERAMIC	0.001MF	50V	
C650	1-126-964-11	ELECT	10MF	20% 50V	
C651	1-136-171-00	FILM	0.33MF	5% 50V	
C662	1-124-563-11	ELECT	2200MF	20% 25V	
C663	1-126-964-11	ELECT	10MF	20% 50V	
C664	1-102-129-00	CERAMIC	0.01MF	10% 50V	
C665	1-126-940-11	ELECT	330MF	20% 25V	

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
		< CONNECTOR >	
CN0008	⚠ 1-508-786-11	PIN, CONNECTOR (5MM PITCH) 2P	
CN0009	⚠ 1-508-765-11	PIN, CONNECTOR (5MM PITCH) 3P	
CN0701	1-573-299-21	CONNECTOR, BOARD TO BOARD 10P	
CN0702	1-695-300-11	CONNECTOR, BOARD TO BOARD 20P	
CN0703	⚠ *1-691-291-11	PIN, CONNECTOR (PC BOARD) 5P	
		< DIODE >	
D601	8-719-510-53	DIODE D4SB60L	
D602	8-719-991-33	DIODE 1SS133T-77	
D603	8-719-109-89	DIODE RD5.6ESB2	
D605	8-719-047-31	DIODE RBA-402L	
D607	8-719-510-12	DIODE D10SC4M	
D608	8-719-510-12	DIODE D10SC4M	
D609	8-719-047-31	DIODE RBA-402L	
D610	8-719-312-39	DIODE R2K-V1	
D611	8-719-510-64	DIODE S2LA20F	
D614	8-719-911-19	DIODE 1SS119-25	
D615	8-719-911-19	DIODE 1SS119-25	
D616	8-719-911-19	DIODE 1SS119-25	
D617	8-719-911-19	DIODE 1SS119-25	
D618	8-719-911-19	DIODE 1SS119-25	
D619	8-719-911-19	DIODE 1SS119-25	
D620	8-719-911-19	DIODE 1SS119-25	
D621	8-719-911-19	DIODE 1SS119-25	
D622	8-719-510-64	DIODE S2LA20F	
D623	8-719-510-64	DIODE S2LA20F	
D625	8-719-911-19	DIODE 1SS119-25	
D626	8-719-911-19	DIODE 1SS119-25	
D627	8-719-911-19	DIODE 1SS119-25	
D628	8-719-911-19	DIODE 1SS119-25	
D630	8-719-991-33	DIODE 1SS133T-77	
D633	8-719-991-33	DIODE 1SS133T-77	
D634	8-719-991-33	DIODE 1SS133T-77	
D636	8-719-511-40	DIODE S1VB40	
		< FERRITE BEAD >	
FB601	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB602	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB603	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB604	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
		< IC >	
IC601	1-810-051-11	POWER MODULE DM-48	
IC602	⚠ 8-749-010-65	PHOTO COUPLER PC123FY2	
IC603	8-759-510-52	IC TEA7605	
		< PROTECTOR MODULE >	
PB601	⚠ 1-801-550-21	PROTECTOR MODULE 2.5A MP250	
PB602	⚠ 1-801-550-21	PROTECTOR MODULE 2.5A MP250	
PB604	⚠ 1-801-550-21	PROTECTOR MODULE 2.5A MP250	
PB605	⚠ 1-801-549-21	PROTECTOR MODULE 4.0A MP400	
		< COIL >	
L605	1-412-523-11	INDUCTOR 6.8UH	
L606	1-412-523-11	INDUCTOR 6.8UH	
		< TRANSISTOR >	
Q601	8-729-032-87	TRANSISTOR 2SC4834NP-F09	
Q602	8-729-032-87	TRANSISTOR 2SC4834NP-F09	
Q603	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q604	8-729-200-21	TRANSISTOR 2SC2500-B	
Q605	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q608	8-729-200-21	TRANSISTOR 2SC2500-B	
Q610	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q612	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q615	8-729-200-21	TRANSISTOR 2SC2500-B	
Q621	8-729-200-21	TRANSISTOR 2SC2500-B	
		< RESISTOR >	
R601	1-202-933-61	FUSIBLE 0.1 10% 1/2W	F
R602	1-247-891-00	CARBON 330K 5% 1/4W	
R603	1-247-891-00	CARBON 330K 5% 1/4W	
R604	1-216-369-00	METAL OXIDE 1 5% 2W	F
R605	1-247-891-00	CARBON 330K 5% 1/4W	
R606	1-247-891-00	CARBON 330K 5% 1/4W	
R607	1-216-369-00	METAL OXIDE 1 5% 2W	F
R608	1-247-887-00	CARBON 220K 5% 1/4W	
R609	1-249-429-11	CARBON 10K 5% 1/4W	F
R610	1-249-419-11	CARBON 1.5K 5% 1/4W	F
R611	1-249-377-11	CARBON 0.47 5% 1/4W	F
R616	⚠ 1-205-949-11	WIREWOUND 1.8 5% 10W	
R617	⚠ 1-205-949-11	WIREWOUND 1.8 5% 10W	
R619	⚠ 1-244-945-91	CARBON 1M 5% 1/2W	
R620	⚠ 1-218-265-91	METAL 8.2M 5% 1W	
R621	1-249-417-11	CARBON 1K 5% 1/4W	F
R622	1-249-430-11	CARBON 12K 5% 1/4W	
R623	1-249-436-11	CARBON 39K 5% 1/4W	
R624	1-249-425-11	CARBON 4.7K 5% 1/4W	
R625	1-247-815-91	CARBON 220 5% 1/4W	
R626	1-247-863-91	CARBON 22K 5% 1/4W	
R627	1-247-815-91	CARBON 220 5% 1/4W	
R628	1-247-807-31	CARBON 100 5% 1/4W	
R636	1-207-905-00	WIREWOUND 0.27 10% 2W	F
R637	1-249-389-11	CARBON 4.7 5% 1/4W	F
R639	1-247-791-91	CARBON 22 5% 1/4W	
R640	1-247-791-91	CARBON 22 5% 1/4W	
R641	1-247-791-91	CARBON 22 5% 1/4W	
R642	1-247-791-91	CARBON 22 5% 1/4W	
R651	1-215-880-00	METAL OXIDE 10 5% 2W	F
R652	1-247-891-00	CARBON 330K 5% 1/4W	
R653	1-247-891-00	CARBON 330K 5% 1/4W	
R654	1-247-891-00	CARBON 330K 5% 1/4W	
R655	1-247-891-00	CARBON 330K 5% 1/4W	
R656	1-249-439-11	CARBON 68K 5% 1/4W	
R657	1-249-429-11	CARBON 10K 5% 1/4W	
R658	1-249-421-11	CARBON 2.2K 5% 1/4W	
R659	1-249-425-11	CARBON 4.7K 5% 1/4W	
R660	1-249-429-11	CARBON 10K 5% 1/4W	
R661	1-249-421-11	CARBON 2.2K 5% 1/4W	
R662	1-249-421-11	CARBON 2.2K 5% 1/4W	
R663	1-249-429-11	CARBON 10K 5% 1/4W	
R664	1-249-429-11	CARBON 10K 5% 1/4W	
R667	1-249-377-11	CARBON 0.47 5% 1/4W	F
R670	1-249-417-11	CARBON 1K 5% 1/4W	
		< RELAY >	
RY601	⚠ 1-755-167-11	RELAY, AC POWER	
RY602	⚠ 1-755-167-11	RELAY, AC POWER	

G C

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
		< TRANSFORMER >	
LF602	⚠ 1-428-860-11	TRANSFORMER, LINE FILTER	
T601	⚠ 1-429-844-11	TRANSFORMER, CONVERTER (PIT)	
T602	⚠ 1-429-264-11	TRANSFORMER, CONVERTER (FBT)	
T603	⚠ 1-429-953-11	TRANSFORMER	
		< THERMISTOR >	
THP601	⚠ 1-801-071-51	THERMISTOR, POSITIVE	
		< VARISTOR >	
VDR601	1-810-977-21	VARISTOR ERZV10D621	
**********			
	*A-1638-092-A	C BOARD, COMPLETE **********	
	4-382-854-11	SCREW (M3X10), P, SW (+)	
		< CAPACITOR >	
C701	1-107-666-11	ELECT 1MF 20% 350V	
C702	1-107-666-11	ELECT 1MF 20% 350V	
C703	1-107-666-11	ELECT 1MF 20% 350V	
C704	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C705	1-126-941-11	ELECT 470MF 20% 16V	
C706	1-126-941-11	ELECT 470MF 20% 16V	
C708	1-126-941-11	ELECT 470MF 20% 16V	
C709	1-102-157-00	CERAMIC 560PF 10% 500V	
C710	1-102-157-00	CERAMIC 560PF 10% 500V	
C711	1-102-157-00	CERAMIC 560PF 10% 500V	
C712	1-126-965-11	ELECT 22MF 20% 50V	
C713	1-162-116-00	CERAMIC 680PF 10% 2KV	
C714	1-162-115-00	CERAMIC 330PF 10% 2KV	
C716	1-162-116-00	CERAMIC 680PF 10% 2KV	
C717	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C718	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C719	1-124-903-11	ELECT 1MF 20% 50V	
C720	1-123-947-00	ELECT 10MF 20% 250V	
C723	1-162-116-00	CERAMIC 680PF 10% 2KV	
		< CONNECTOR >	
CN0004	1-695-915-11	TAB (CONTACT)	
CN0403	*1-564-512-11	PLUG, CONNECTOR 9P	
CN0421	*1-508-767-00	PIN, CONNECTOR (5MM PITCH) 5P	
		< DIODE >	
D701	8-719-991-33	DIODE 1SS133T-77	
D702	8-719-901-83	DIODE 1SS83	
D703	8-719-901-83	DIODE 1SS83	
D704	8-719-901-83	DIODE 1SS83	
D705	8-719-991-33	DIODE 1SS133T-77	
D706	8-719-908-03	DIODE GP08D	
D707	8-719-991-33	DIODE 1SS133T-77	
D712	8-719-923-60	DIODE MTZJ-T-77-9.1A	
D714	8-719-921-88	DIODE MTZJ-T-13B	
D715	8-719-911-19	DIODE 1SS119-25	
D716	8-719-911-19	DIODE 1SS119-25	
D717	8-719-911-19	DIODE 1SS119-25	
D718	8-719-982-96	DIODE MTZJ-T-77-2.2A	
D719	8-719-982-96	DIODE MTZJ-T-77-2.2A	
D720	8-719-901-83	DIODE 1SS83	
D721	8-719-901-83	DIODE 1SS83	
D722	8-719-901-83	DIODE 1SS83	
D723	8-719-901-83	DIODE 1SS83	
D724	8-719-018-82	DIODE RGP02-20EL-6394	
		< IC >	
IC703	8-759-073-90	IC TDA6111Q	
IC704	8-759-073-90	IC TDA6111Q	
IC705	8-759-073-90	IC TDA6111Q	
		< CRT SOCKET >	
J701	⚠ 1-526-990-22	SOCKET, CRT	
		< COIL >	
L701	1-410-671-31	INDUCTOR 47UH	
L704	1-408-405-00	INDUCTOR 4.7UH	
L705	1-408-405-00	INDUCTOR 4.7UH	
L706	1-408-405-00	INDUCTOR 4.7UH	
L709	1-408-409-00	INDUCTOR 10UH	
		< TRANSISTOR >	
Q701	8-729-255-12	TRANSISTOR 2SC2551	
Q702	8-729-255-12	TRANSISTOR 2SC2551	
Q703	8-729-255-12	TRANSISTOR 2SC2551	
Q704	8-729-026-41	TRANSISTOR 2SA933AS-QRT	
Q705	8-729-029-56	TRANSISTOR DTA144ESA	
Q706	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q707	8-729-173-38	TRANSISTOR 2SA733-K	
		< RESISTOR >	
R701	1-249-420-11	CARBON 1.8K 5% 1/4W	
R702	1-249-425-11	CARBON 4.7K 5% 1/4W	
R703	1-249-435-11	CARBON 33K 5% 1/4W	
R704	1-249-429-11	CARBON 10K 5% 1/4W	
R705	1-249-430-11	CARBON 12K 5% 1/4W	
R706	1-247-863-91	CARBON 22K 5% 1/4W	
R707	1-247-863-91	CARBON 22K 5% 1/4W	
R708	1-247-863-91	CARBON 22K 5% 1/4W	
R709	1-249-416-11	CARBON 820 5% 1/4W	
R710	1-249-416-11	CARBON 820 5% 1/4W	
R711	1-249-416-11	CARBON 820 5% 1/4W	
R712	1-249-421-11	CARBON 2.2K 5% 1/4W	
R713	1-249-417-11	CARBON 1K 5% 1/4W	
R714	1-249-417-11	CARBON 1K 5% 1/4W	
R715	1-249-417-11	CARBON 1K 5% 1/4W	
R716	1-249-417-11	CARBON 1K 5% 1/4W	
R717	1-249-417-11	CARBON 1K 5% 1/4W	
R718	1-249-417-11	CARBON 1K 5% 1/4W	
R719	1-249-417-11	CARBON 1K 5% 1/4W	
R720	1-215-926-00	METAL OXIDE 33K 5% 3W F	
R721	1-215-926-00	METAL OXIDE 33K 5% 3W F	
R722	1-215-926-00	METAL OXIDE 33K 5% 3W F	
R723	1-249-408-11	CARBON 180 5% 1/4W	
R724	1-249-408-11	CARBON 180 5% 1/4W	
R725	1-249-408-11	CARBON 180 5% 1/4W	
R726	1-202-565-00	SOLID 470 20% 1/2W	
R727	1-202-565-00	SOLID 470 20% 1/2W	
R728	1-202-565-00	SOLID 470 20% 1/2W	
R729	1-249-424-11	CARBON 3.9K 5% 1/4W	
R730	1-249-424-11	CARBON 3.9K 5% 1/4W	

C D

REF.NO.	PART NO.	DESCRIPTION				REMARK
R731	1-249-424-11	CARBON	3.9K	5%	1/4W	
R732	1-202-549-00	SOLID	100	20%	1/2W	
R733	1-247-863-91	CARBON	22K	5%	1/4W	
R734	1-202-549-00	SOLID	100	20%	1/2W	
R735	1-249-416-11	CARBON	820	5%	1/4W	
R741	1-202-884-11	SOLID	820K	20%	1/2W	
R743	1-202-884-11	SOLID	820K	20%	1/2W	
R750	1-249-429-11	CARBON	10K	5%	1/4W	
R751	1-249-438-11	CARBON	56K	5%	1/4W	
R752	1-249-417-11	CARBON	1K	5%	1/4W	F
R753	1-215-911-11	METAL OXIDE	100	5%	3W	F
R754	1-202-841-00	SOLID	180K	20%	1/2W	
R755	1-249-429-11	CARBON	10K	5%	1/4W	
R756	1-249-432-11	CARBON	18K	5%	1/4W	
R757	1-249-431-11	CARBON	15K	5%	1/4W	
		< VARIABLE RESISTOR >				
RV701	1-230-641-11	RES, ADJ, METAL GLAZE 2.2M				
RV704	1-241-656-21	RES, ADJ, METAL FILM 110M				
**********						
	*A-1640-244-A	D BOARD, COMPLETE				
		**********				
	4-382-854-11	SCREW (M3X10), P, SW (+)				
		< CAPACITOR >				
C101	1-126-965-11	ELECT	22MF	20%	50V	
C236	1-136-165-00	FILM	0.1MF	5%	50V	
C237	1-136-165-00	FILM	0.1MF	5%	50V	
C238	1-126-967-11	ELECT	47MF	20%	16V	
C241	1-126-967-11	ELECT	47MF	20%	16V	
C242	1-126-953-11	ELECT	2200MF	20%	35V	
C243	1-136-165-00	FILM	0.1MF	5%	50V	
C244	1-126-953-11	ELECT	2200MF	20%	35V	
C245	1-136-165-00	FILM	0.1MF	5%	50V	
C260	1-126-964-11	ELECT	10MF	20%	50V	
C261	1-126-964-11	ELECT	10MF	20%	50V	
C262	1-104-665-11	ELECT	100MF	20%	25V	
C263	1-136-165-00	FILM	0.1MF	5%	50V	
C264	1-126-933-11	ELECT	100MF	20%	16V	
C265	1-136-165-00	FILM	0.1MF	5%	50V	
C266	1-104-665-11	ELECT	100MF	20%	25V	
C267	1-162-318-11	CERAMIC	0.001MF	10%	500V	
C268	1-162-318-11	CERAMIC	0.001MF	10%	500V	
C269	1-126-967-11	ELECT	47MF	20%	16V	
C270	1-136-165-00	FILM	0.1MF	5%	50V	
C271	1-126-965-11	ELECT	22MF	20%	50V	
C272	1-136-165-00	FILM	0.1MF	5%	50V	
C273	1-136-161-00	FILM	0.047MF	5%	50V	
C274	1-124-925-11	ELECT	2.2MF	20%	50V	
C275	1-124-925-11	ELECT	2.2MF	20%	50V	
C276	1-126-967-11	ELECT	47MF	20%	16V	
C277	1-126-934-11	ELECT	220MF	20%	16V	
C278	1-107-714-11	ELECT	10MF	20%	16V	
C279	1-126-965-11	ELECT	22MF	20%	50V	
C280	1-136-169-00	FILM	0.22MF	5%	50V	
C281	1-126-967-11	ELECT	47MF	20%	16V	
C283	1-136-169-00	FILM	0.22MF	5%	50V	
C620	1-126-967-11	ELECT	47MF	20%	50V	
C639	1-126-964-11	ELECT	10MF	20%	50V	

REF.NO.	PART NO.	DESCRIPTION			REMARK
C652	1-136-171-00	FILM	0.33MF	5%	50V
C653	1-104-661-91	ELECT	330MF	20%	16V
C654	1-104-664-11	ELECT	47MF	20%	25V
C656	1-126-967-11	ELECT	47MF	20%	16V
C657	1-136-165-00	FILM	0.1MF	5%	50V
C658	1-136-165-00	FILM	0.1MF	5%	50V
C659	1-136-165-00	FILM	0.1MF	5%	50V
C660	1-136-164-00	FILM	0.082MF	5%	50V
C666	1-104-661-91	ELECT	330MF	20%	16V
C667	1-136-165-00	FILM	0.1MF	5%	50V
C668	1-136-165-00	FILM	0.1MF	5%	50V
C669	1-136-165-00	FILM	0.1MF	5%	50V
C670	1-136-165-00	FILM	0.1MF	5%	50V
C671	1-136-165-00	FILM	0.1MF	5%	50V
C801	1-123-024-21	ELECT	33MF		160V
C802	1-136-207-11	FILM	0.047MF	10%	250V
C804	1-102-110-00	CERAMIC	220PF	10%	50V
C805	1-102-117-00	CERAMIC	820PF	10%	50V
C807	1-162-129-00	CERAMIC	150PF	10%	2KV
C808	1-162-116-00	CERAMIC	680PF	10%	2KV
C809	1-162-116-00	CERAMIC	680PF	10%	2KV
C810	1-136-558-11	FILM	0.0039MF	10%	400V
C811	1-109-948-11	FILM	0.015MF	3%	2.5KV
C812	1-129-722-00	FILM	0.047MF	10%	630V
C813	1-109-844-11	FILM	0.68MF	5%	400V
C814	1-129-702-00	FILM	0.001MF	10%	400V
C816	1-109-844-11	FILM	0.68MF	5%	400V
C817	1-136-759-11	FILM	0.039MF	5%	630V
C819	1-137-102-11	FILM	0.022MF	10%	250V
C822	1-126-967-11	ELECT	47MF	20%	50V
C823	1-102-129-00	CERAMIC	0.01MF	10%	50V
C824	1-162-117-00	CERAMIC	100PF	10%	500V
C825	1-126-964-11	ELECT	10MF	20%	50V
C827	1-102-228-00	CERAMIC	470PF	10%	500V
C835	1-107-655-11	ELECT	47MF	20%	250V
C836	1-102-228-00	CERAMIC	470PF	10%	500V
C837	1-102-228-00	CERAMIC	470PF	10%	500V
C838	1-102-228-00	CERAMIC	470PF	10%	500V
C841	1-106-375-12	MYLAR	0.022MF	10%	250V
C842	1-106-363-00	MYLAR	0.0068MF	10%	400V
C852	1-126-968-11	ELECT	100MF	20%	50V
C854	1-102-129-00	CERAMIC	0.01MF	10%	50V
C855	1-126-941-11	ELECT	470MF	20%	25V
C856	1-102-129-00	CERAMIC	0.01MF	10%	50V
C857	1-126-941-11	ELECT	470MF	20%	25V
C860	1-106-220-00	MYLAR	0.1MF	10%	100V
C862	1-130-789-00	FILM	1MF	5%	100V
C866	1-137-040-11	FILM	0.0022MF	10%	400V
C867	1-107-909-11	ELECT	47MF	20%	50V
C873	1-161-754-00	CERAMIC	0.001MF	10%	2KV
C874	1-164-645-11	CERAMIC	1000PF	10%	500V
C900	1-101-810-00	CERAMIC	100PF	5%	500V
C901	1-101-810-00	CERAMIC	100PF	5%	500V
C902	1-137-372-11	FILM	0.022MF	5%	50V
C903	1-137-372-11	FILM	0.022MF	5%	50V
C905	1-126-964-11	ELECT	10MF	20%	50V
C907	1-124-903-11	ELECT	1MF	20%	50V
C908	1-124-903-11	ELECT	1MF	20%	50V
C910	1-126-967-11	ELECT	47MF	20%	50V
C911	1-126-967-11	ELECT	47MF	20%	50V

D

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
C1619	1-106-220-00	MYLAR 0.1MF 10% 100V	
C1621	1-106-367-00	MYLAR 0.01MF 10% 400V	
C1628	1-136-244-11	FILM 0.1MF 5% 50V	
C1629	1-130-481-00	FILM 0.0068MF 5% 50V	
C1632	1-136-203-11	FILM 0.01MF 10% 250V	
C2701	1-126-964-11	ELECT 10MF 20% 50V	
C2702	1-104-664-11	ELECT 47MF 20% 25V	
C2706	1-102-820-00	CERAMIC 330PF 5% 50V	
		< CONNECTOR >	
CN0001	*1-564-520-11	PLUG, CONNECTOR 5P	
CN0002	*1-568-878-51	PIN, CONNECTOR 3P	
CN0004	1-568-878-51	PIN, CONNECTOR 3P	
CN0005	1-695-915-11	TAB (CONTACT)	
CN0101	*1-573-296-21	CONNECTOR, BOARD TO BOARD 10P	
CN0102	1-695-297-11	CONNECTOR, BOARD TO BOARD 20P	
CN0103	*1-564-509-11	PLUG, CONNECTOR 6P	
CN0521	*1-508-767-00	PIN, CONNECTOR (5MM PITCH) 5P	
CN0703 ⚠	*1-580-844-11	PIN, CONNECTOR (POWER)	⚠
CN0723 ⚠	*1-695-292-11	PIN, CONNECTOR (POWER)	⚠
CN0740	*1-568-880-51	PIN, CONNECTOR 5P	
CN0741	*1-564-512-11	PLUG, CONNECTOR 9P	
CN0743	*1-564-596-11	PLUG, CONNECTOR 15P	
CN0745	1-695-298-11	CONNECTOR, BOARD TO BOARD 40P	
CN0747	*1-568-880-51	PIN, CONNECTOR 5P	
CN3133	1-568-882-51	PIN, CONNECTOR 7P	
		< DIODE >	
D101	8-719-982-27	DIODE MTZJ-33C	
D236	8-719-911-19	DIODE 1SS119-25	
D237	8-719-911-19	DIODE 1SS119-25	
D238	8-719-911-19	DIODE 1SS119-25	
D239	8-719-911-19	DIODE 1SS119-25	
D262	8-719-911-19	DIODE 1SS119-25	
D264	8-719-911-19	DIODE 1SS119-25	
D276	8-719-911-19	DIODE 1SS119-25	
D278	8-719-911-19	DIODE 1SS119-25	
D279	8-719-911-19	DIODE 1SS119-25	
D280	8-719-911-19	DIODE 1SS119-25	
D281	8-719-911-19	DIODE 1SS119-25	
D282	8-719-911-19	DIODE 1SS119-25	
D612	8-719-911-19	DIODE 1SS119-25	
D613	8-719-911-19	DIODE 1SS119-25	
D631	8-719-911-19	DIODE 1SS119-25	
D632	8-719-911-19	DIODE 1SS119-25	
D633	8-719-911-19	DIODE 1SS119-25	
D802	8-719-979-99	DIODE ERD08M-15	
D803	8-719-043-14	DIODE ESAD39M-06C	
D804	8-719-971-20	DIODE ERC38-06	
D805	8-719-908-03	DIODE GP08D	
D806	8-719-908-03	DIODE GP08D	
D810	8-719-979-85	DIODE EGP20G	
D811	8-719-302-43	DIODE EL1Z	
D812	8-719-510-26	DIODE D1NL20	
D813	8-719-510-26	DIODE D1NL20	
D814	8-719-908-03	DIODE GP08D	
D815	8-719-110-13	DIODE RD9.1ESB2	
D816	8-719-110-41	DIODE RD15ES-B2	
D817	8-719-911-19	DIODE 1SS119-25	
D818	8-719-911-19	DIODE 1SS119-25	
D819	8-719-911-19	DIODE 1SS119-25	
D873	8-719-911-19	DIODE 1SS119-25	
D874	8-719-911-19	DIODE 1SS119-25	
D901	8-719-030-11	DIODE SLA-570KT3F	
	*4-203-258-11	HOLDER, LED ; D901	
D1609	8-719-979-85	DIODE EGP20G	
D1611	8-719-911-19	DIODE 1SS119-25	
D2701	8-719-911-19	DIODE 1SS119-25	
D2702	8-719-911-19	DIODE 1SS119-25	
		< CONNECTOR >	
DY1	*1-580-798-11	CONNECTOR PIN (DY) 6P	
		< FUSE >	
F601 ⚠	1-532-399-00	FUSE 5A/250V	⚠
⚠	*1-533-725-11	HOLDER, FUSE ; F601	⚠
		< IC >	
IC236	8-759-190-89	IC TDA7265	
	4-202-373-01	SPRING, IC ; IC236	
	4-202-710-01	SPACER, INSULATING ; IC236	
IC260	8-759-330-93	IC TDA7309	
IC261	8-759-502-21	IC TDA2822M	
IC603	8-759-095-34	IC LM2940T-8.0	
IC604	8-759-513-71	IC PQ05RF21	
	4-202-373-01	SPRING, IC ; IC604	
IC606	8-759-991-43	IC LM78L12ACZ	
IC607	8-759-513-71	IC PQ05RF21	
	4-202-373-01	SPRING, IC ; IC607	
IC801	8-759-103-93	IC UPC393C	
IC802	8-759-192-71	IC STV9379	
	4-202-373-01	SPRING, IC ; IC802	
IC900	8-742-014-00	RECEIVER HIC SBX1981-51	
IC2701	8-759-603-37	IC M5216P	
		< SOCKET >	
J900	1-764-606-11	JACK	
J901	1-568-678-21	TERMINAL BLOCK S 3P	
J1200	1-770-218-11	JACK, PIN	
		< COIL >	
L602	1-412-525-31	INDUCTOR 10UH	
L603	1-412-525-31	INDUCTOR 10UH	
L802	1-459-474-11	COIL (WITH CORE)	
L803	1-459-474-11	COIL (WITH CORE)	
L806	1-459-592-11	COIL (WITH CORE) (PMC) 150UH	
L807	1-412-524-11	INDUCTOR 8.2UH	
L811	1-459-104-00	COIL, WITH CORE 10MMH	
L813	1-406-988-21	COIL, CHOKE 6.8MMH	
L814	1-422-613-11	COIL, AIR CORE	
L815	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH	
L816	1-408-947-00	INDUCTOR 2.2MMH	
L902	1-408-409-00	INDUCTOR 10UH	
L903	1-408-409-00	INDUCTOR 10UH	
L1604	1-406-988-21	COIL, CHOKE 6.8MMH	
L1605	1-406-988-21	COIL, CHOKE 6.8MMH	
		< TRANSISTOR >	
Q276	8-729-030-03	TRANSISTOR DTC144ESA-TP	

D

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q277	8-729-173-38	TRANSISTOR 2SA733-K	
Q278	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q279	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q280	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q281	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q282	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q606	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q607	8-729-029-56	TRANSISTOR DTA144ESA	
Q613	8-729-030-03	TRANSISTOR DTC144ESA-TP	
Q614	8-729-029-56	TRANSISTOR DTA144ESA	
Q616	8-729-030-03	TRANSISTOR DTC144ESA-TP	
Q617	8-729-029-67	TRANSISTOR DTC114ESA-TP	
Q618	8-729-029-56	TRANSISTOR DTA144ESA	
Q620	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q624	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q801	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q802	8-729-821-07	TRANSISTOR 2SC3997CA	
	4-200-399-01	SPACER, IC ; Q802	
Q803	8-729-039-68	TRANSISTOR IRF620	
	4-202-373-01	SPRING, IC ; Q803	
Q804	8-729-039-68	TRANSISTOR IRF620	
Q1610	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1611	8-729-017-06	TRANSISTOR 2SC4793	
Q2701	8-729-119-78	TRANSISTOR 2SC2785-HFE	

< RESISTOR >

R236	1-249-424-11	CARBON	3.9K	5%	1/4W	
R237	1-249-417-11	CARBON	1K	5%	1/4W	
R239	1-249-424-11	CARBON	3.9K	5%	1/4W	
R240	1-249-417-11	CARBON	1K	5%	1/4W	
R244	1-249-413-11	CARBON	470	5%	1/4W	
R245	1-249-430-11	CARBON	12K	5%	1/4W	
R246	1-249-430-11	CARBON	12K	5%	1/4W	
R247	1-249-413-11	CARBON	470	5%	1/4W	
R248	1-249-425-11	CARBON	4.7K	5%	1/4W	
R249	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R250	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R251	1-249-429-11	CARBON	10K	5%	1/4W	
R252	1-249-429-11	CARBON	10K	5%	1/4W	
R255	1-249-411-11	CARBON	330	5%	1/4W	
R256	1-249-411-11	CARBON	330	5%	1/4W	
R260	1-247-863-91	CARBON	22K	5%	1/4W	
R261	1-247-863-91	CARBON	22K	5%	1/4W	
R262	1-249-421-11	CARBON	2.2K	5%	1/4W	
R263	1-249-421-11	CARBON	2.2K	5%	1/4W	
R264	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R265	1-249-389-11	CARBON	4.7	5%	1/4W	F
R266	1-249-389-11	CARBON	4.7	5%	1/4W	F
R267	1-247-815-91	CARBON	220	5%	1/4W	
R268	1-247-815-91	CARBON	220	5%	1/4W	
R269	1-249-415-11	CARBON	680	5%	1/4W	
R270	1-249-415-11	CARBON	680	5%	1/4W	
R271	1-247-742-11	CARBON	180	5%	1/2W	F
R277	1-249-419-11	CARBON	1.5K	5%	1/4W	
R278	1-249-441-11	CARBON	100K	5%	1/4W	
R279	1-249-429-11	CARBON	10K	5%	1/4W	
R280	1-249-425-11	CARBON	4.7K	5%	1/4W	
R281	1-249-437-11	CARBON	47K	5%	1/4W	
R282	1-249-430-11	CARBON	12K	5%	1/4W	
R283	1-249-429-11	CARBON	10K	5%	1/4W	
R284	1-249-432-11	CARBON	18K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R285	1-249-425-11	CARBON	4.7K	5%	1/4W	
R286	1-249-421-11	CARBON	2.2K	5%	1/4W	
R287	1-249-412-11	CARBON	390	5%	1/4W	
R288	1-249-421-11	CARBON	2.2K	5%	1/4W	
R289	1-249-421-11	CARBON	2.2K	5%	1/4W	
R290	1-247-807-31	CARBON	100	5%	1/4W	
R291	1-249-421-11	CARBON	2.2K	5%	1/4W	
R292	1-249-429-11	CARBON	10K	5%	1/4W	
R293	1-249-429-11	CARBON	10K	5%	1/4W	
R294	1-249-429-11	CARBON	10K	5%	1/4W	
R295	1-247-885-00	CARBON	180K	5%	1/4W	
R296	1-247-885-00	CARBON	180K	5%	1/4W	
R297	1-247-807-31	CARBON	100	5%	1/4W	
R298	1-247-807-31	CARBON	100	5%	1/4W	
R630	1-249-429-11	CARBON	10K	5%	1/4W	
R631	1-215-477-00	METAL	220K	1%	1/4W	
R632	1-249-417-11	CARBON	1K	5%	1/4W	
R633	1-249-429-11	CARBON	10K	5%	1/4W	
R634	1-247-895-91	CARBON	470K	5%	1/4W	
R635	1-215-926-00	METAL OXIDE	33K	5%	3W	F
R638	1-249-425-11	CARBON	4.7K	5%	1/4W	
R644	1-249-425-11	CARBON	4.7K	5%	1/4W	
R645	1-249-410-11	CARBON	270	5%	1/4W	
R646	1-249-403-11	CARBON	68	5%	1/4W	
R647	1-249-420-11	CARBON	1.8K	5%	1/4W	
R665	1-249-425-11	CARBON	4.7K	5%	1/4W	
R666	1-249-413-11	CARBON	470	5%	1/4W	
R676	1-249-437-11	CARBON	47K	5%	1/4W	
R677	1-249-437-11	CARBON	47K	5%	1/4W	
R678	1-249-421-11	CARBON	2.2K	5%	1/4W	
R679	1-247-815-91	CARBON	220	5%	1/4W	
R802	1-215-916-00	METAL OXIDE	680	5%	3W	F
R803	1-215-916-00	METAL OXIDE	680	5%	3W	F
R804	1-215-916-00	METAL OXIDE	680	5%	3W	F
R805	1-215-923-00	METAL OXIDE	10K	5%	3W	F
R806	1-249-411-11	CARBON	330	5%	1/4W	
R807	1-247-843-11	CARBON	3.3K	5%	1/4W	
R808	1-216-385-11	METAL OXIDE	0.47	5%	3W	F
R809	1-215-880-00	METAL OXIDE	10	5%	2W	F
R810	1-215-914-11	METAL OXIDE	330	5%	3W	F
R811	1-216-434-11	METAL OXIDE	1.8K	5%	1W	F
R817	1-202-972-61	FUSIBLE	1	5%	1/4W	F
R818	1-249-377-11	CARBON	0.47	5%	1/4W	F
R819	1-249-377-11	CARBON	0.47	5%	1/4W	F
R820	1-214-907-00	METAL	56K	1%	1/2W	
R821	1-249-427-11	CARBON	6.8K	5%	1/4W	
R823	1-249-420-11	CARBON	1.8K	5%	1/4W	
R835	1-249-432-11	CARBON	18K	5%	1/4W	
R837	1-249-422-11	CARBON	2.7K	5%	1/4W	
R842	1-249-399-11	CARBON	33	5%	1/4W	F
R843	1-202-822-00	SOLID	2.2K	20%	1/2W	
R844	1-249-424-11	CARBON	3.9K	5%	1/4W	
R845	1-247-881-00	CARBON	120K	5%	1/4W	
R846	1-249-422-11	CARBON	2.7K	5%	1/4W	
R847	1-249-437-11	CARBON	47K	5%	1/4W	
R848	1-249-425-11	CARBON	4.7K	5%	1/4W	
R849	1-249-429-11	CARBON	10K	5%	1/4W	
R850	1-249-389-11	CARBON	4.7	5%	1/4W	F
R851	1-216-399-00	METAL OXIDE	6.8	5%	3W	F
R854	1-249-436-11	CARBON	39K	5%	1/4W	

D VM

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R855	1-249-417-11	CARBON	1K	5%	1/4W	
R857	1-202-822-00	SOLID	2.2K	20%	1/2W	
R859	1-249-432-11	CARBON	18K	5%	1/4W	
R860	1-247-843-11	CARBON	3.3K	5%	1/4W	
R861	1-249-417-11	CARBON	1K	5%	1/4W	
R862	1-249-383-11	CARBON	1.5	5%	1/4W	F
R863	1-216-475-11	METAL OXIDE	120	5%	3W	F
R865	1-249-436-11	CARBON	39K	5%	1/4W	
R866	1-249-432-11	CARBON	18K	5%	1/4W	
R867	1-216-390-11	METAL OXIDE	1.2	5%	3W	F
R868	1-249-418-11	CARBON	1.2K	5%	1/4W	
R895	1-215-866-11	METAL OXIDE	330	5%	1W	F
R900	1-247-815-91	CARBON	220	5%	1/4W	
R901	1-249-417-11	CARBON	1K	5%	1/4W	
R902	1-249-417-11	CARBON	1K	5%	1/4W	
R908	1-249-401-11	CARBON	47	5%	1/4W	
R909	1-249-437-11	CARBON	47K	5%	1/4W	
R910	1-249-437-11	CARBON	47K	5%	1/4W	
R911	1-249-425-11	CARBON	4.7K	5%	1/4W	
R912	1-249-421-11	CARBON	2.2K	5%	1/4W	
R913	1-249-425-11	CARBON	4.7K	5%	1/4W	
R914	1-249-421-11	CARBON	2.2K	5%	1/4W	
R922	1-249-406-11	CARBON	120	5%	1/4W	
R923	1-249-406-11	CARBON	120	5%	1/4W	
R925	1-249-429-11	CARBON	10K	5%	1/4W	
R926	1-249-429-11	CARBON	10K	5%	1/4W	
R1641	1-247-863-91	CARBON	22K	5%	1/4W	
R1645	1-249-439-11	CARBON	68K	5%	1/4W	
R1646	1-249-421-11	CARBON	2.2K	5%	1/4W	
R1648	1-215-875-11	METAL OXIDE	10K	5%	1W	F
R1649	1-249-429-11	CARBON	10K	5%	1/4W	
R1650	1-249-429-11	CARBON	10K	5%	1/4W	
R1651	1-249-399-11	CARBON	33	5%	1/4W	F
R1652	1-249-421-11	CARBON	2.2K	5%	1/4W	
R2701	1-247-863-91	CARBON	22K	5%	1/4W	
R2702	1-247-863-91	CARBON	22K	5%	1/4W	
R2703	1-247-863-91	CARBON	22K	5%	1/4W	
R2704	1-247-863-91	CARBON	22K	5%	1/4W	
R2705	1-249-429-11	CARBON	10K	5%	1/4W	
R2706	1-249-429-11	CARBON	10K	5%	1/4W	
R2708	1-249-429-11	CARBON	10K	5%	1/4W	
R2719	1-212-857-00	FUSIBLE	10	5%	1/4W	F
		< SWITCH >				
S900 ⚠	1-571-433-21	SWITCH, PUSH (AC POWER)				
S900	1-692-979-11	SWITCH, TACTILE				
S901	1-692-979-11	SWITCH, TACTILE				
S902	1-692-979-11	SWITCH, TACTILE				
		< TRANSFORMER >				
T801	1-427-762-11	TRANSFORMER, FERRITE (HDT)				
T803	1-426-897-11	TRANSFORMER, FERRITE (PMT)				
T804	1-429-288-11	HLT				
T805 ⚠	8-598-986-XX	TRANSFORMER ASSY, FLYBACK				
T806	1-413-059-00	TRANSFORMER, FERRITE (DFT)				

REF.NO.	PART NO.	DESCRIPTION				REMARK
	*A-1644-075-A	VM BOARD, COMPLETE				
		**********				
	4-382-854-11	SCREW (M3X10), P, SW (+)				
		< CAPACITOR >				
C1701	1-124-119-00	ELECT	330MF	20%	16V	
C1704	1-161-830-00	CERAMIC	0.0047MF		500V	
C1706	1-107-638-11	ELECT	33MF	20%	160V	
C1707	1-124-907-11	ELECT	10MF	20%	50V	
C1708	1-163-075-00	CERAMIC CHIP	0.047MF		50V	
C1709	1-129-702-00	FILM	0.001MF	10%	630V	
C1710	1-136-203-11	FILM	0.01MF	10%	250V	
C1711	1-162-318-11	CERAMIC	0.001MF	10%	500V	
C1712	1-107-667-11	ELECT	2.2MF	20%	160V	
C1713	1-162-318-11	CERAMIC	0.001MF	10%	500V	
C1714	1-136-203-11	FILM	0.01MF	10%	250V	
C1715	1-163-001-11	CERAMIC CHIP	220PF	10%	50V	
C1716	1-124-907-11	ELECT	10MF	20%	50V	
C1718	1-124-120-11	ELECT	220MF	20%	16V	
C1719	1-124-907-11	ELECT	10MF	20%	50V	
C1722	1-101-810-00	CERAMIC	100PF	5%	500V	
C1723	1-104-396-11	ELECT	10MF	20%	16V	
C1724	1-101-810-00	CERAMIC	100PF	5%	500V	
		< CONNECTOR >				
CN1701	1-774-418-11	CONNECTOR, BOARD TO BOARD 8P				
CN1830	*1-564-510-11	PLUG, CONNECTOR 7P				
		< DIODE >				
D1701	8-719-914-43	DIODE DAN202K				
D1702	8-719-914-42	DIODE DA204K				
D1704	8-719-982-37	DIODE MTZJ-39C				
D1705	8-719-982-37	DIODE MTZJ-39C				
D1706	8-719-914-42	DIODE DA204K				
D1708	8-719-914-42	DIODE DA204K				
D1709	8-719-914-42	DIODE DA204K				
		< COIL >				
L1702	1-408-410-00	INDUCTOR	12UH			
		< TRANSISTOR >				
Q1701	8-729-901-59	TRANSISTOR BF199				
Q1702	8-729-216-22	TRANSISTOR 2SA1162-G				
Q1703	8-729-017-05	TRANSISTOR 2SA1837				
Q1704	8-729-920-74	TRANSISTOR 2SC2412K-QR				
Q1705	8-729-017-06	TRANSISTOR 2SC4793				
Q1706	8-729-920-74	TRANSISTOR 2SC2412K-QR				
Q1707	8-729-920-74	TRANSISTOR 2SC2412K-QR				
Q1708	8-729-901-59	TRANSISTOR BF199				
Q1710	8-729-216-22	TRANSISTOR 2SA1162-G				
Q1711	8-729-039-27	TRANSISTOR BC546B				
Q1712	8-729-039-25	TRANSISTOR BC556B				
		< RESISTOR >				
JR1701	1-216-296-91	METAL GLAZE	0	5%	1/10W	
JR1702	1-216-296-91	METAL GLAZE	0	5%	1/10W	
R1701	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R1702	1-249-413-11	CARBON	470	5%	1/4W	

VM K J1

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1703	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R1704	1-249-418-11	CARBON	1.2K	5%	1/4W	
R1705	1-247-736-11	CARBON	56	5%	1/2W	F
R1706	1-249-414-11	CARBON	560	5%	1/4W	F
R1707	1-249-411-11	CARBON	330	5%	1/4W	
R1709	1-249-412-11	CARBON	390	5%	1/4W	
R1711	1-249-432-11	CARBON	18K	5%	1/4W	
R1712	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R1713	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R1714	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R1715	1-215-866-11	METAL OXIDE	330	5%	1W	F
R1716	1-249-417-11	CARBON	1K	5%	1/4W	F
R1717	1-249-432-11	CARBON	18K	5%	1/4W	
R1718	1-249-412-11	CARBON	390	5%	1/4W	
R1719	1-249-416-11	CARBON	820	5%	1/4W	
R1720	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R1721	1-249-414-11	CARBON	560	5%	1/4W	
R1723	1-249-429-11	CARBON	10K	5%	1/4W	
R1724	1-216-689-11	METAL GLAZE	39K	5%	1/10W	
R1725	1-249-413-11	CARBON	470	5%	1/4W	
R1726	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R1727	1-249-402-11	CARBON	56	5%	1/4W	F
R1730	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R1731	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R1736	1-247-807-31	CARBON	100	5%	1/4W	
R1737	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R1738	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R1739	1-216-222-00	METAL GLAZE	10K	5%	1/8W	
R1740	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R1741	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R1743	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R1744	1-249-393-11	CARBON	10	5%	1/4W	
R1745	1-249-393-11	CARBON	10	5%	1/4W	

****

*A-1649-015-A K BOARD, COMPLETE
****

< CAPACITOR >

C1252	1-126-967-11	ELECT	47MF	20%	16V
C1253	1-126-967-11	ELECT	47MF	20%	16V
C1254	1-136-165-00	FILM	0.1MF	5%	50V
C1255	1-136-165-00	FILM	0.1MF	5%	50V
C1256	1-126-953-11	ELECT	2200MF	20%	35V
C1257	1-136-165-00	FILM	0.1MF	5%	50V
C1258	1-126-953-11	ELECT	2200MF	20%	35V
C1259	1-136-165-00	FILM	0.1MF	5%	50V

< CONNECTOR >

CN0271	*1-564-508-11	PLUG, CONNECTOR 5P
CN0272	*1-564-509-11	PLUG, CONNECTOR 6P
CN0273	*1-564-508-11	PLUG, CONNECTOR 5P

< DIODE >

D1250	8-719-991-33	DIODE 1SS133T-77
D1251	8-719-991-33	DIODE 1SS133T-77
D1252	8-719-991-33	DIODE 1SS133T-77
D1253	8-719-991-33	DIODE 1SS133T-77

REF.NO.	PART NO.	DESCRIPTION				REMARK

< IC >

IC1250	8-759-190-89	IC TDA7265
	4-202-373-01	SPRING, IC ; IC1250
	4-202-710-01	SPACER, INSULATING ; IC1250

< RESISTOR >

R1250	1-249-424-11	CARBON	3.9K	5%	1/4W	
R1251	1-249-424-11	CARBON	3.9K	5%	1/4W	
R1253	1-249-417-11	CARBON	1K	5%	1/4W	
R1256	1-249-417-11	CARBON	1K	5%	1/4W	
R1258	1-249-413-11	CARBON	470	5%	1/4W	
R1259	1-249-430-11	CARBON	12K	5%	1/4W	
R1260	1-249-430-11	CARBON	12K	5%	1/4W	
R1261	1-249-413-11	CARBON	470	5%	1/4W	
R1262	1-249-425-11	CARBON	4.7K	5%	1/4W	
R1263	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R1264	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R1265	1-249-426-11	CARBON	5.6K	5%	1/4W	
R1266	1-249-426-11	CARBON	5.6K	5%	1/4W	
R1267	1-249-429-11	CARBON	10K	5%	1/4W	
R1268	1-249-429-11	CARBON	10K	5%	1/4W	

****

*A-1651-083-A J1 BOARD, COMPLETE (KV-28WS4A/28WS4D/
********** 28WS4E/28WS4K/
28WS4R)
*A-1651-089-A J1 BOARD, COMPLETE (KV-28WS4B)
****

< CAPACITOR >

C551	1-101-005-00	CERAMIC	0.022MF		50V
C554	1-101-005-00	CERAMIC	0.022MF		50V
C560	1-101-005-00	CERAMIC	0.022MF		50V
C563	1-101-005-00	CERAMIC	0.022MF		50V
C567	1-102-119-00	CERAMIC	0.0015MF	10%	50V
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)			
C568	1-102-119-00	CERAMIC	0.0015MF	10%	50V
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)			

< CONNECTOR >

CN550	*1-564-519-11	PLUG, CONNECTOR 4P
CN551	*1-564-519-11	PLUG, CONNECTOR 4P
CN552	1-564-524-11	PLUG, CONNECTOR 9P
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
	*1-564-521-11	PLUG, CONNECTOR 6P (KV-28WS4B)
CN553	*1-564-520-11	PLUG, CONNECTOR 5P
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
CN572	*1-564-521-11	PLUG, CONNECTOR 6P

< DIODE >

D550	8-719-923-60	DIODE MTZJ-T-77-9.1A
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
D551	8-719-923-60	DIODE MTZJ-T-77-9.1A
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
D552	8-719-923-60	DIODE MTZJ-T-77-9.1A
		(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)

< SOCKET >

J550	1-537-339-11	TERMINAL BOARD
J551	1-537-978-11	TERMINAL BOARD

J1 T

REF.NO.	PART NO.	DESCRIPTION	REMARK
J552	1-695-817-11	JACK BLOCK, PIN 3P	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
J553	1-569-578-11	TERMINAL, S (WITH SW)	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
		< COIL >	
L550	1-402-711-11	INDUCTOR, WIDE BAND	
L552	1-402-711-11	INDUCTOR, WIDE BAND	
L554	1-402-711-11	INDUCTOR, WIDE BAND	
L556	1-402-711-11	INDUCTOR, WIDE BAND	
		< RESISTOR >	
R551	1-249-426-11	CARBON 5.6K 5% 1/4W	
R552	1-249-426-11	CARBON 5.6K 5% 1/4W	
R553	1-249-393-11	CARBON 10 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R554	1-249-394-11	CARBON 12 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R555	1-249-394-11	CARBON 12 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R556	1-247-895-91	CARBON 470K 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R557	1-247-895-91	CARBON 470K 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R558	1-249-412-11	CARBON 390 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R559	1-249-412-11	CARBON 390 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R560	1-249-412-11	CARBON 390 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R561	1-249-412-11	CARBON 390 5% 1/4W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
**********			
	*A-1652-042-A	T BOARD, COMPLETE (KV-28WS4A/28WS4D/ ********** 28WS4E/28WS4K/ 28WS4R)	
	*A-1652-044-A	T BOARD, COMPLETE (KV-28WS4B) **********	
		< CAPACITOR >	
C5002	1-165-319-11	CERAMIC CHIP 0.1MF 50V	
C5003	1-124-120-11	ELECT 220MF 20% 16V	
C5004	1-163-113-00	CERAMIC CHIP 68PF 5% 50V	(KV-28WS4B)
C5005	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	(KV-28WS4B)
C5006	1-163-113-00	CERAMIC CHIP 68PF 5% 50V	(KV-28WS4B)
C5007	1-163-275-11	CERAMIC CHIP 0.001MF 5% 50V	
C5008	1-163-037-11	CERAMIC CHIP 0.022MF 10% 50V	
C5009	1-126-965-11	ELECT 22MF 20% 50V	
C5010	1-124-907-11	ELECT 10MF 20% 50V	
C5011	1-126-961-11	ELECT 2.2MF 20% 50V	
C5012	1-109-953-11	ELECT 2.2MF 20% 50V	(KV-28WS4B)
C5013	1-163-023-00	CERAMIC CHIP 0.015MF 10% 50V	
C5014	1-109-953-11	ELECT 2.2MF 20% 50V	
C5015	1-165-319-11	CERAMIC CHIP 0.1MF 50V	
C5016	1-124-120-11	ELECT 220MF 20% 16V	
C5018	1-163-237-11	CERAMIC CHIP 27PF 5% 50V	
C5019	1-104-664-11	ELECT 47MF 20% 25V	(KV-28WS4B)
		< FILTER >	
CF5001	1-760-106-11	FILTER, CERAMIC	
CF5002	1-567-100-00	FILTER, CERAMIC (KV-28WS4B)	
CF5003	1-760-450-21	FILTER, CERAMIC	
		< CONNECTOR >	
CN5001	*1-564-508-11	PLUG, CONNECTOR 5P	
CN5002	*1-564-509-11	PLUG, CONNECTOR 6P	
		< DIODE >	
D5002	8-719-421-57	DIODE MA73-TX	
D5003	8-719-421-57	DIODE MA73-TX (KV-28WS4B)	
D5004	8-719-421-57	DIODE MA73-TX	
		< IC >	
IC5001	8-759-398-24	IC U2860B-BFPG3	
IC5002	8-752-072-94	IC CXA1875AM-T4	
		< COIL >	
L5001	1-408-406-00	INDUCTOR 5.6UH	
L5002	1-408-406-00	INDUCTOR 5.6UH	
L5003	1-412-751-11	INDUCTOR 18UH (KV-28WS4B)	
		< TRANSISTOR >	
Q5001	8-729-920-74	TRANSISTOR 2SC2412K-QR (KV-28WS4B)	
Q5002	8-729-039-67	TRANSISTOR BSS83 (KV-28WS4B)	
Q5004	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q5005	8-729-901-01	TRANSISTOR DTC144EK-T146 (KV-28WS4B)	
Q5006	8-729-901-01	TRANSISTOR DTC144EK-T146 (KV-28WS4B)	
Q5007	8-729-920-74	TRANSISTOR 2SC2412K-QR (KV-28WS4B)	
Q5008	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q5009	8-729-901-01	TRANSISTOR DTC144EK-T146	
Q5010	8-729-901-01	TRANSISTOR DTC144EK-T146 (KV-28WS4B)	
Q5011	8-729-901-01	TRANSISTOR DTC144EK-T146	
Q5012	8-729-901-01	TRANSISTOR DTC144EK-T146 (KV-28WS4B)	
Q5014	8-729-038-96	TRANSISTOR IMZ1A-T109	
Q5015	8-729-216-22	TRANSISTOR 2SA1162-G (KV-28WS4B)	
Q5016	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q5017	8-729-216-22	TRANSISTOR 2SA1162-G	
		< RESISTOR >	
R5001	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R5002	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R5004	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R5005	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R5007	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R5008	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R5009	1-208-774-11	METAL CHIP 470 0.50% 1/10W	(KV-28WS4B)
R5010	1-208-774-11	METAL CHIP 470 0.50% 1/10W	(KV-28WS4B)
R5011	1-208-774-11	METAL CHIP 470 0.50% 1/10W	(KV-28WS4B)
R5012	1-216-073-00	METAL GLAZE 10K 5% 1/10W	(KV-28WS4B)
R5015	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
R5016	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	

T

The components identified by shading and marked ⚠ are critical for safety.
Replace only with the part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION			REMARK
R5017	1-216-035-00	METAL GLAZE	270	5%	1/10W
R5018	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R5020	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R5021	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R5022	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R5023	1-216-049-91	METAL GLAZE	1K	5%	1/10W (KV-28WS4B)
R5024	1-216-089-91	METAL GLAZE	47K	5%	1/10W (KV-28WS4B)
R5025	1-216-089-91	METAL GLAZE	47K	5%	1/10W (KV-28WS4B)
R5026	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R5027	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R5028	1-216-039-00	METAL GLAZE	390	5%	1/10W
R5029	1-216-039-00	METAL GLAZE	390	5%	1/10W (KV-28WS4B)
R5030	1-216-039-00	METAL GLAZE	390	5%	1/10W
R5031	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R5032	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W (KV-28WS4B)
R5033	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R5034	1-216-025-91	METAL GLAZE	100	5%	1/10W
R5035	1-216-025-91	METAL GLAZE	100	5%	1/10W
R5036	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R5037	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R5041	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R5042	1-216-081-00	METAL GLAZE	22K	5%	1/10W (KV-28WS4B)
R5043	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R5044	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R5045	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R5046	1-216-073-00	METAL GLAZE	10K	5%	1/10W (KV-28WS4B)
R5047	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R5048	1-216-073-00	METAL GLAZE	10K	5%	1/10W (KV-28WS4B)
R5052	1-216-041-00	METAL GLAZE	470	5%	1/10W
R5053	1-216-041-00	METAL GLAZE	470	5%	1/10W
R5054	1-216-041-00	METAL GLAZE	470	5%	1/10W
R5055	1-216-025-91	METAL GLAZE	100	5%	1/10W
R5056	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W (KV-28WS4B)
R5057	1-216-025-91	METAL GLAZE	100	5%	1/10W (KV-28WS4B)
R5058	1-216-033-00	METAL GLAZE	220	5%	1/10W
R5059	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R5060	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R5061	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R5062	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R5063	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W

< TUNER >

TU5001	1-693-338-21	TUNER (TUVIF) (AEP) (KV-28WS4A/28WS4D/28WS4E/28WS4K/28WS4R)
	1-693-340-21	TUNER (TUVIF) (FR) (KV-28WS4B)

****

REF.NO.	PART NO.	DESCRIPTION	REMARK
		MISCELLANEOUS	
		**********	
⚠	1-411-893-11	COIL, DEGAUSSING	
	1-452-032-00	MAGNET, DISK; 10MM Ø	
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
	1-452-724-11	COIL, NA ROTATION (RT-165)	
⚠	1-453-222-11	TRANSFORMER ASSY, FLYBACK	(NX-4003/U2B4)
	1-505-154-11	SPEAKER (6.5CM)	
	1-505-155-11	SPEAKER (10CM)	
⚠	1-251-317-31	CAP ASSY, HIGH-VOLTAGE	
⚠	1-571-433-21	SWITCH, PUSH (AC POWER)	
	1-693-338-21	TUNER (TUVIF) (AEP) (KV-28WS4A/28WS4B/28WS4D/28WS4E/28WS4K/28WS4R)	
	1-693-340-21	TUNER (TUVIF) (FR) (KV-28WS4B)	
⚠	1-751-680-11	CORD, POWER (WITH NOISE FILTER) 2.5A/250V	
⚠	8-451-433-11	DEFLECTION YOKE (Y28GICM)	
⚠	8-453-005-31	NECK ASSY, (NA297-M3)	
V901	⚠	8-737-763-05	PICTURE TUBE (SD-284T) (M66LGY011X)

****

REF.NO.	PART NO.	DESCRIPTION	REMARK
		ACCESSORIES AND PACKING MATERIALS	
		**********	
	1-765-654-11	CABLE, SPEAKER	
	*4-050-191-01	CUSHION (UPPER) (ASSY)	
	*4-050-192-11	CUSHION (LOWER) (ASSY)	
	*4-050-193-01	INDIVIDUAL CARTON	
	4-203-585-41	MANUAL, INSTRUCTION (KV-28WS4A)	(ITALIAN)
	4-203-585-51	MANUAL, INSTRUCTION (KV-28WS4B)	(FRENCH)
	4-203-585-11	MANUAL, INSTRUCTION (KV-28WS4D) (GERMAN/ENGLISH/DUTCH/FRENCH/ITALIAN/GREEK/TURKISH)	
	4-203-585-71	MANUAL, INSTRUCTION (KV-32WS4E) (PORTUGUESE/DANISH/SWEDISH/NORWEGIAN/FINNISH/SPANISH/FRENCH/DUTCH/GERMAN)	
	4-203-585-91	MANUAL, INSTRUCTION (KV-28WS4K/28WS4R) (ENGLISH/RUSSIAN/BULGARIAN)	
	*4-395-957-01	BAG, PROTECTION	
		REMOTE COMMANDER	
		**********	
	1-473-692-11	COMMANDER, STANDARD TYPE (RM-962)	

****

SONY

Sony Deutschland GmbH
Hugo-Eckener-Straße 20, D-50829 Köln-Ossendorf, Postfach 3012 49, 50782 Köln
Telefon (02 21) 5966-0, Telefax (02 21) 59 66-349, ISDN Videokonferenz (02 21) 9 56 10 10/03/06

Sehr geehrte Kundin, sehr geehrter Kunde,

zusammen mit dem bestellten Service Manual erhalten Sie eine Einstellanleitung für das entsprechende Chassis-Modell.

Diese wurde von unseren "Spezialisten" erstellt und beinhaltet die korrekten Einstellparameter der folgenden Gerätetypen:

KV-25C3D

KV-29C3D

KV-28WS4D

KV-32WS4D

KV-28WX2D

KV-32WX2D

Nach Austausch des Speicherbausteins **IC1003** (A-BOARD) oder einem Reset ist es erforderlich, das Gerät neu abzugleichen.
Alle erforderlichen Schritte sind in dieser Broschüre aufgelistet.

Wir hoffen, Ihnen die Reparatur- und Einstellzeit an diesem komplexen Chassis mit Hilfe der Unterlage zu verkürzen und verbleiben,

Mit freundlichen Grüßen
Ihr Sony Service Team

Stand: 99-06-09

NVM ADJUSTMENT STANDARD AE-4 CHASSIS

KV-25C3D
KV-25C3E
KV-25C3A
KV-25C3B

KV-29C3D
KV-29C3E
KV-29C3A
KV-29C3K
KV-29C3R
KV-29C3B

KV-28WX2D
KV-28WX2E
KV-28WX2A
KV-28WX2B

KV-32WX2D
KV-32WX2E
KV-32WX2A
KV-32WX2B
KV-32WX2U

KV-28WS4A
KV-28WS4E
KV-28WS4B
KV-28WS4D
KV-28WS4K
KV-28WS4R

KV-32WS4U
KV-32WS4A
KV-32WS4E
KV-32WS4F
KV-32WS4D
KV-32WS4K
KV-32WS4R

Erstellt von J.G.Esser_TT und W.Wagner_TVE/TPE

Impressum

Herausgeber
Sony, Technical Training

Änderungen vorbehalten. Für Druck- und Informationsfehler übernehmen wir keine Haftung.

Stand: 09/04/97

Inhaltsverzeichnis

Allgemeines		Seite 01 - 05
Software Übersicht AE-4		Seite 06 - 06
Init TV		Seite 07 - 10
TV set configuration TT13		Seite 11 - 15
Pip, Lumisponder & AutoWide		Seite 16 - 16
Sub Adjust		Seite 17 - 20
Video Proc	TDA 4780	Seite 21 - 22
Col Dec Main	TDA 9144	Seite 23 - 24
Deflect. Cont	SDA 9361	Seite 25 - 27
Col Dec Sub	TDA 9143	Seite 28 - 28
Feature Box	S87C654	Seite 29 - 32
AI	TDA 9170	Seite 33 - 33
DA	SDA 9280	Seite 34 - 36
Single PIP	SDA 9288	Seite 37 - 39
Sound		Seite 40 - 45
Line23 det		Seite 46 - 48

Vorwort

In erster Linie beinhaltet diese Einstellhilfe die korrekten Einstellparameter aller auf der Titelseite aufgeführten Gerätetypen. Um einheitliche Ergebnisse gewährleisten zu können, muß die Überprüfung bzw. Korrektur der Einstellwerte im Wide Mode erfolgen. **Die Einstellhilfe hat Gültigkeit für die auf Seite 6 aufgeführten Software-Versionen.**

Darüber hinaus wurden in dieser Unterlage die im ROM abgelegten Grunddaten für die Software-Version V8.40E hinzugefügt. Ein neues EEPROM wird nach dem Einschalten automatisch mit diesen Daten geräteintern vorprogrammiert. Im Vergleich dazu stehen dann noch die Grunddaten, die durch den Befehl TT49 (nur Produktion) auftreten können sowie eine dritte Kategorie von Grunddaten, die ausgelöst durch spezielle TT-Befehle (siehe TT76, 77, 78, 81, 82, 84, 85, 86, 87) nur Daten eines vorbestimmten Schaltkreises überschreiben.

Nach Auswertung aller zu Verfügung stehenden Daten, können Abweichungen zum Originalabgleich erkannt und durch graue Felder bzw. durch ein **K** (Korrektur) gekennzeichnet werden. Nur diese Einträge bedürfen nach einem EEPROM-Austausch noch einer Aktualisierung, womit sich der Zeitaufwand im Servicefall durch weniger zu kontrollierende Einträge minimieren läßt.

Da sich Geräte mit anderslautenden Software-Versionen von der Abgleichprozedur zur Version V8.40E geringfügig unterscheiden könnten, sollten Sie nach einem EEPROM-Austausch alle Einstellungen Punkt für Punkt mit der Einstellhilfe vergleichen.

AE40X V8. 40E AE-4 28/11/96

Init TV
Pip, Lumisponder & AutoWide
Sub Adjust

Video Proc	TDA 4780
Col Dec Main	TDA 9144
Deflect. Cont	SDA 9361
Col Dec Sub	TDA 9143
Feature Box	S87C654
AI	TDA 9170
DA	SDA 9280
Single PIP	SDA 9288

Sound
Line23 det

Official	Version	Datum	Modelle	Chassis
AE401		20.09.1996	WX, C3 only	AE4
AE401A		24.09.1996		
AE401B		25.09.1996		
AE401C		26.09.1996		
AE401D		27.09.1996		
AE401E		02.10.1996		
AE401F		09.10.1996		
AE401G		10.10.1996		
AE401H		11.10.1996		
AE401K		16.10.1996		
AE401L		23.10.1996		
AE401M		24.10.1996		
AE401N		01.11.1996		
AE402	V8.39i	08.11.1996	WS only	
AE402B		14.11.1996		
AE40X	V8.40B	20.11.1996	WX, WS, C3	
AE40X	V8.40C	25.11.1996		
AE40X	V8.40D	26.11.1996		
AE40X	V8.40E	26.11.1996		
AE40X	V8.40F	28.11.1996		
AE40X	V8.40G	11.12.1996		
AE40X	V8.40H	11.12.1996		
AE40X	V8.40I	16.12.1996		
AE403	V8.40K	19.12.1996		

Nr.	Funktion	Initialization / INIT BYTE							siehe Text
		EEPROM (neu)	nach Eingabe von TT49	Destination (Land)/Serienkonfiguration					
				B	U	E (16:9 only)		OTHER	
01	B / G	on	on	on	off	on		on	K
02	I	on	on	on	on	on		off	K
03	D / K	off	off	on	off	on		on	K
04	AUS	off	off	off	off	off		off	
05	L	on	on	on	off	on		off	K
06	SAT	off	off	off	off	off		off	
07	M	off	off	off	off	off		off	

z.B. KV-...D

K = **K**orrektur

Nach einem **EEPROM-Austausch** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Schalter nach Serienkonfiguration erfolgen. Siehe auch Seite 13-15 (**TT13 / Test Mode 2** _Display of Software Version and TV set configuration).

Die SAT-Funktion kann nicht aktiviert werden, sie wird durch die Software sofort wieder in den Aus-Zustand (off) zurückgeschaltet.

Kennzeichnet nicht die Empfangsnorm, sondern dient als Länderschlüssel.

MODEL	Destination	Code	Empfangsnorm
KV-32WS4**A**	Italian		
KV-32WS4**D**	AEP		z.B. B/G (CCIR / (VHF & UHF), D/K (Osinorm / OIRT)
KV-32WS4**E**	Spanish	**OTHER**	
KV-32WS4**K**	OIRT		
KV-32WS4**R**	OIRT		
KV-32WS4**B/FR**	French	**B/FR**	
KV-32WS4**U**	UK (England)	**U**	

Siehe auch Service Manual (Titelseite)

Nr.	Funktion	Initialization / MODEL INIT							siehe Text
		EEPROM (neu)	nach Eingabe von TT49	Model / Gerätetyp (Serienkonfiguration)					
				C25/C29	28/WX2	32WX2	28WS4	32WS4	
01	SCART 1	on	on	on	on	on	on	on	
02	SCART 2	on	on	on	on	on	on	on	
03	FRONT IN 3	on	on	on	on	on	on	on	
04	SCART 4	off	off	off	off	off	off	off	
05	VGA	off	off	off	off	off	off	off	
06	WIDE SCREEN	on	on	off	on	on	on	on	K
07	W32 MODEL	off	off	off	off	on	off	on	K
08	PICTURE ROTATION	on	on	on	on	on	on	on	
09	AUTO WIDE	off	off	off	on	on	on	on	K
10	AUTO WIDE DEF. SMART	off	off	off	on	on	on	on	K
11	RUSSIAN SOUND CARRIER	off	off	off	off	off	off	off	

K = **K**orrektur
Nach einem **EEPROM-Austausch** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Schalter wie vorgegeben (Serienkonfiguration) erfolgen. Siehe auch Seite 13-15 (**TT13 / Test Mode 2** _Display of Software Version and TV set configuration).

Nr.	Funktion	Initialization / FEATURES							
		EEPROM (neu)	nach Eingabe von TT49	Model / Gerätetyp (Serienkonfiguration)					siehe Text
				C25/C29	28/32WX	28/32WS			
01	PAL COMB	on	on	off	off	on			K
02	RGB PRIORITY	off	off	off	off	off			
03	60 PRGS	off	off	off	off	off			
04	LINE23 DET	off	off	off	on	on			K
05	LUMISPONDER	off	off	on	off	off			K
06	AI	on	on	off	on	on			K
07	SRS - DOLBY	off	off	off	off	off			
08	DOLBY PROLOGIC	off	off	off	off	on			K
09	SOUND EFFECTS	off	off	off	off	off			
10	EQUALIZER	off	off	off	off	on			K
11	SUB TUNER	on	on	off	off	on			K
12	PIP	off	off	on	off	off			K
13	PAP	on	on	off	off	on			K
14	MULTI PIP	off	off	off	on	on			K
15	PAT	off	off	off	on	on			K

K = Korrektur
Nach einem **EEPROM-Austausch** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Schalter wie vorgegeben (Serienkonfiguration) erfolgen. Siehe auch Seite 13-15 (**TT13 / Test Mode 2** _Display of Software Version and TV set configuration).

Nr.	Funktion	Initialization / LANGUAGES							
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	Destination (Land)/Serienkonfiguration				siehe Text
						R	K	A/B/D/E/U	
01	Nat. Opt. Char	0	0	3		4	1	3	K
02	Menü Language	West	West	West		East	East	West	K

z.B.
KV-32WS4D

Beispiel:

K = Korrektur
Nach einem **EEPROM-Austausch** muß zum Beispiel bei dem Gerätetyp KV-32WS4D eine Aktualisierung der grau gekennzeichneten Funktion **01** erfolgen. Den hierfür benötigten Zahlenwert können Sie der oben aufgeführten Tabelle (siehe Serienkonfiguration) entnehmen. Siehe auch Seite 13-15 (**TT13 / Test Mode 2** _Display of Software Version and TV set configuration).
Eine weitere Korrektur wird erforderlich, wenn die Gerätetypen mit den Buchstaben **R** und **K** enden. Beispiel KV-...**K**. Bei diesen Geräten ist dann zusätzlich noch die Funktion 02 (Menü Language) von West auf East umzuschalten.

Der Befehl TT49 nimmt in diesem Menü eine Sonderstellung ein. Nach Eingabe von TT49 würden sich die Einstellwerte eines Seriengerätes nicht verändern. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 ebenfalls nicht verändert.

Der Eintrag [3] bewirkt, daß in der Übersicht (TT13/Test Mode 2) im ersten Block/Zeile 4 der Eintrag **TXT CHAR. 55** geschrieben wird. **Character Set 55 = West Europe/Turkish (D-Version).**

Die Umschaltung (**Nat. Opt. Char = 3**) kann parallel auch mit **TT29 / Test Mode 2** erfolgen.

Menü Language **ALL**----East----West

Die **ALL-Einstellung** im Menü Language (Sprachenmenü) darf für Anwender nicht freigeschaltet werden. Sie ist nur der Fertigung für Testzwecke vorbehalten.

TV set configuration (TT13)

Die produktionsseitig programmierten Initialisierungsdaten sowie die aktuelle Softwareversion können jetzt durch Eingabe des Befehls TT13 (Test Mode 2) auf dem Bildschirm dargestellt werden. Diese Auflistung gibt zusammengefaßt alle wichtigen Voreinstellungen wieder, die im Service-Menü unter dem Menüpunkt Init TV eingestellt wurden.
Eine Aktualisierung dieser Daten kann im Fehlerfall (z.B. NVM-Datenverlust) **nur** im Service-Menü (Init TV) durchgeführt werden.

Einstellhilfen mit den gerätespezifischen Initialisierungsdaten geben hier Hilfestellung und ermöglichen einen korrekten Abgleich. (Siehe auch Seite 7-10 oder 13-15).

Durch TT-Befehle (Test Mode 2) hervorgerufene Einträge sind nachfolgend noch einmal gesondert gekennzeichnet.

Funktion		Wo wird eingestellt?
PRGS.	[ ]	siehe Initialization/FEATURES
Level 2.5	[ ]	siehe **Test Mode 2 (TT18)**
RAM SPC	[ ]	kein Zugriff (nur Produktion)
TXT CHAR.	[ ]	siehe Initialization/LANGUAGES oder **Test Mode 2 (TT27, TT29 und TT89)**
PCF	[ ]	siehe Initialization/FEATURES

SUB TUNER	[ ]	siehe Initialization/FEATURES
PIP	[ ]	siehe Initialization/FEATURES
PAP	[ ]	siehe Initialization/FEATURES
RGB PRTY	[ ]	siehe Initialization/FEATURES
EQUALIZER	[ ]	siehe Initialization/FEATURES
DSP	[ ]	kein Zugriff (nur Produktion)
DOLBY	[ ]	siehe Initialization/FEATURES
Rotation	[ ]	siehe Initialization/MODEL INIT oder **Test Mode 2 (TT71)**
WIDE SCREE	[ ]	siehe Initialization/MODEL INIT
SCART 1	[ ]	siehe Initialization/MODEL INIT
SCART 2	[ ]	siehe Initialization/MODEL INIT
FRONT IN	[ ]	siehe Initialization/MODEL INIT
SCART 4	[ ]	siehe Initialization/MODEL INIT
SYS B/G	[ ]	siehe Initialization/INIT BYTE
SYS I	[ ]	siehe Initialization/INIT BYTE
SYS L	[ ]	siehe Initialization/INIT BYTE
SYS D/K	[ ]	siehe Initialization/INIT BYTE
SYS M	[ ]	siehe Initialization/INIT BYTE
SYS AUS	[ ]	siehe Initialization/INIT BYTE
SYS SAT	[ ]	siehe Initialization/INIT BYTE
PHIL BUG	[ ]	siehe **Test Mode 2 (TT37/TT13)**

TV set configuration TT13/ Initialisierungsvorgaben zu KV-28/32WS4**D**

AE40X	V8.40E	AE-4	28/11/96
PRGS.	[100]	WIDE SCREE	[yes]
Level 2.5	[yes]	SCART 1	[yes]
RAM SPC	[no]	SCART 2	[yes]
TXT CHAR.	[55]	**FRONT IN**	[**yes**]
PCF	[yes]	SCART 4	[no]
SUB TUNER	[yes]	SYS B/G	[yes]
PIP	[no]	SYS I	[no]
PAP	[yes]	SYS L	[no]
RGB PRTY	[no]	SYS D/K	[yes]
EQUALIZER	[yes]	SYS M	[no]
DSP	[no]	SYS AUS	[no]
DOLBY	[yes]	SYS SAT	[no]
Rotation	[yes]	**PHIL BUG**	[**yes**]

TV set configuration TT13/ Initialisierungsvorgaben zu KV-28/32WX2**D**

AE401K	V8.38L	AE-4	16/10/96
PRGS.	[100]	WIDE SCREE	[yes]
Level 2.5	[no]	SCART 1	[yes]
RAM SPC	[no]	SCART 2	[yes]
TXT CHAR.	[55]	**FRONT IN**	[**yes**]
PCF	[no]	SCART 4	[no]
SUB TUNER	[no]	SYS B/G	[yes]
PIP	[no]	SYS I	[no]
PAP	[no]	SYS L	[no]
RGB PRTY	[no]	SYS D/K	[yes]
EQUALIZER	[no]	SYS M	[no]
DSP	[no]	SYS AUS	[no]
DOLBY	[no]	SYS SAT	[no]
Rotation	[yes]	**PHIL BUG**	[yes]

TV set configuration TT13/ Initialisierungsvorgaben zu KV-25/29C3**D**

AE40X	V8.40F	AE-4	05/12/96
PRGS.	[100]	WIDE SCREE	[no]
Level 2.5	[no]	SCART 1	[yes]
RAM SPC	[no]	SCART 2	[yes]
TXT CHAR.	[55]	**FRONT IN**	[**yes**]
PCF	[no]	SCART 4	[no]
SUB TUNER	[no]	SYS B/G	[yes]
PIP	[yes]	SYS I	[no]
PAP	[no]	SYS L	[no]
RGB PRTY	[no]	SYS D/K	[yes]
EQUALIZER	[no]	SYS M	[no]
DSP	[no]	SYS AUS	[no]
DOLBY	[no]	SYS SAT	[no]
Rotation	[yes]	**PHIL BUG**	[**yes**]

Nr.	Funktion	PIP, LUMISPONDER & AUTOWIDE							
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	Serienkonfiguration				siehe Text
					All	C-Serie	WX-Serie	WS-Serie	
01	PIP CONTRAST	+4	+4	0	0	X			K
02	PIP LEFT	+20	+20	-20	-20	X			K
03	PIP RIGHT	+20	+20	-20	-20	X			K
04	PIP UP	+20	+20	0	0	X			K
05	PIP DOWN	+20	+20	0	0	X			K
06	LUMISPONDER CURVE	2	2	1	1	X			K
07	AUTOWIDE LOGO	on	on	on	on		X	X	
08	AUTOWIDE SUBTITLE	on	on	on	on		X	X	
09	AUTOWIDE ZOOM SHIFT	15	15	7	7		X	X	K

K = **K**orrektur
Nach einem **EEPROM-Austausch** müssen die grau gekennzeichneten Felder mit den Werten der Serienkonfiguration aktualisiert werden.

Der Befehl TT49 nimmt bei diesem Menü eine Sonderstellung ein. Nach Eingabe von TT49 würden sich die Einstellwerte eines Seriengerätes nicht verändern. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 ebenfalls nicht verändert.

Nr.	Funktion	Sub Adjustment							siehe Text
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	Serienkonfiguration				
					All	4:3	16:9 FR	16:9 others	
01	Sub Picture	0	0	0		-5	-2	-2	K
02	Sub Color	0	0	0		Adj.	-2	-2	K
03	Sub Brightness	0	0	0		-10	-10	-7	K
04	4 / 3 Center	0	0	0	0				
05	PAP H Center	0	0	0	+14				K
06	PAP HWE Offset	0	0	0	-5				K
07	Menue / Text H - Pos	-1	-1	-2	-2				K
08	PAT RGB Offset	7	7	6		0	Adj.	Adj.	K
09	PAT RGB Gain	31	31	30		0	Adj.	Adj.	K
10	Extra Framing Window	255	255	255	255				

K = **K**orrektur
Nach einem EEPROM-Austausch müssen die grau gekennzeichneten Felder mit den Werten der Serienkonfiguration aktualisiert werden. (Funktion **01-03, 05-09**).

Der Befehl TT49 nimmt bei diesem Menü eine Sonderstellung ein. Bei einem Seriengerät verändern sich nach Eingabe von TT49 die Einstellwerte der Funktionen 01-03 und 05-09. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 nicht verändert.

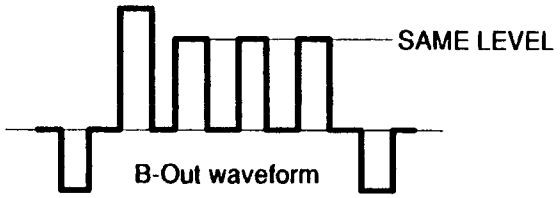
Zu Funktion **01-03:**
Die Funktionen **Sub Picture, Sub Color** und **Sub Brightness** werden nicht wie im Service Manual beschrieben abgeglichen, sondern durch Eingabe von optimierten Werten voreingestellt. Eine Ausnahme ergibt sich bei 4:3-Geräten, hier ist die Funktion **Sub Color** wie auf Seite 19 beschrieben abzugleichen.

Zu Funktion **04-07:**
Die für alle Geräte aufgeführten Einstellwerte sind optimierte Vorgaben und dürfen im Servicefall nicht verändert werden.

Zu Funktion **08-09:**
Adj. = Abgleich erforderlich (Siehe Seite 19/20).

Zu Funktion **02** (**Sub Color** / **Adj**ustment nur bei **4:3**):

Sub Color Adjustment
1. Input a PAL color bar signal.
2. Connect an oscilloscope to **pin 3** of **CN3703** / C-Board (z.B. KV-29**C3**).
2. Connect an oscilloscope to **pin 3** of **CN0403** / C-Board (z.B. KV-32**WX2** or KV-32**WS4**).
3. Enter into **Service mode**.
4. Choose **Sub Adjustment**.
5. Enter into **Sub Color** mode.
6. Adjust the sub colour data so that cyan, magenta and blue colour bars are of equal height.



Achtung: Bei 16:9-Modellen ist kein Abgleich erforderlich, hier wird der Einstellwert mit -2 vorgegeben (siehe auch Seite 17).

Zu Funktion **08-09**:

PAT RGB Offset-und PAT RGB Gain-Einstellung
1. Im Test Mode 2 TT75 aufrufen (Informationszeile L = XX_G = XX wird im Text sichtbar).
2. PAT RGB Offset = **L** (Joystick/**ROT**: Cursor **nach links** bewegen bedeutet, der Einstellwert wird **kleiner**. Joystick/**GELB**: Cursor **nach rechts** bewegen bedeutet, der Einstellwert wird **größer**).

3. PAT RGB Gain = **G** (Joystick/**BLAU**: Cursor **nach unten** bewegen bedeutet, der Einstellwert wird **kleiner**. Joystick/**GRÜN**: Cursor **nach oben** bewegen bedeutet Einstellwert wird **größer**).

To get correct working PaT function the text level of Megatext has too much tolerance.Therefore this level has to be adjusted in CBA. Adjustable is the **gain (a)** and the **offset value (b)** of the output stages R, G and B of Megatext. The output signals looks like diagramm 1. In CBA the levels for RGB **(Pin 1,3,5/CN412)** has to be adjusted:

a to 1,35V, **b** to 0,95V (Einstellen mit TT75/ siehe auch Seite 19).

Diagramm 1

This has to be done in PaT mode. Be careful the 5V supply voltage of A-Board should be correct. The result has to be stored in NVM Bank AE MTX Byte 4 24hex. Bit 0-2 is **b**, Bit 3-7 is **a**.

Nr.	Funktion	Einstellwerte des TDA4780						siehe Text
			nach Eingabe von		Serienkonfiguration			
		EEPROM (neu)	TT49	TT84	All	4:3	16:9	
01	BRT	31	31	31	31			
02	COL	31	31	31	31			
03	PIC	53	53	53	53			
04	HUE	31	31	31	31			
05	R GAIN	37	37	37		40	31	K
06	G GAIN	16	16	16	Adj.			K
07	B GAIN	8	8	8	Adj.			K
08	R LVL REF	31	31	31	31			
09	G LVL REF	31	31	31	Adj.			K
10	B LVL REF	31	31	31	Adj.			K
11	PEAK DRV LIMIT	63	63	63		55	48	K
12	GAMMA	31	31	31		31	0	K
13	SCP ON = 3LEV OFF = 2LEV	off	off	off	off			
14	DELAY	off	off	off	off			
15	DATA BUF	off	off	off	off			
16	NTSC MATRIX	off	off	off	off			
17	HDTV	off	off	off	off			
18	FSBL	off	off	off	off			
19	AUTO CUT OFF	on	on	on	on			
20	FSW 2 DIS	off	off	off	off			
21	FSW 2	off	off	off	off			
22	FSW 1 DIS	off	off	off	off			
23	FSW 1	off	off	off	off			
24	ADAPT BLACK	off	off	off		on	off	

Nr.	Funktion	Einstellwerte des TDA4780						siehe Text
			nach Eingabe von		Serienkonfiguration			
		EEPROM (neu)	TT49	TT84	All	4:3	16:9	
25	Y HIGH 1V	off	off	off	off			
26	MOD2	off	off	off	off			
27	BLUE STRETCH	on	on	off	*			
28	VM OUT	off	off	off	off			
29	PEAK DRV ABS	on	on	on	on			
30	TIME CNST PEAK LIMIT	off	off	off	off			

K = Korrektur
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT84** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **05-07** und **09-12** nach Abgleichanleitung erfolgen.

Zu Funktion 27: * (Switch off for whitebalance adjustment and switch on for shipping TT08 / Test Mode 2).

Nr.	Funktion	Einstellwerte des TDA9144				siehe Text
		EEPROM (neu)	nach Eingabe von TT49	nach Eingabe von TT85	Serienkonfiguration All	
01	Source	2	2	2	0	K
02	Trap bypass	off	off	off	off	
03	Comb Filter	on	on	on	off	K
04	Loop closed	on	on	on	on	
05	Time Const	0	0	0	1	K
06	XTAL	3	3	3	3	
07	Field Frq	3	3	3	3	
08	OutPort A	off	off	off	off	
09	OutPort B	off	off	off	off	
10	Standard	0	0	0	0	
11	Forced RGB	off	off	off	off	
12	Enable FS	off	off	off	off	
13	External RGB clamp	off	off	off	off	
14	Hue	32	32	32	31	K
15	Line Lock HA mode	on	on	on	on	
16	Force wide window	off	off	off	off	
17	Ext. MACP chroma filt	off	off	off	off	
18	Pal+ Helper demod.	off	off	off	off	
19	Pal+ Helper blank	0	0	0	0	
20	Lumi to Helper delay	0	0	0	1	K
21	Blanked Sync on Yout	off	off	off	off	
22	Baseband delay bypass	off	off	off	off	
23	Low Power Standby	off	off	off	off	
24	MacroVision gating	on	on	on	off	K

Nr.	Funktion	Einstellwerte des TDA9144				siehe Text
		EEPROM (neu)	nach Eingabe von TT49	nach Eingabe von TT85	Serienkonfiguration All	
25	Lumi delay control	7	7	7	9	K

K = Korrektur
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT85** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **01, 03, 05, 14 , 20, 24** und **25** nach Serienkonfiguration erfolgen.

Zu Funktion 17-20: (used in TDA9144 only)

Color Dec TDA9143 (Anwendung bei nicht Pal Plus-Geräten) / Color Dec TDA9144 (Anwendung bei Pal Plus-Geräten).

Zu Funktion 24 (Macro Vision gating):
Diese Funktion wurde zwischenzeitlich neu bestimmt und könnte bei der Überprüfung bzw. Menüdurchsicht unterschiedliche Einstellungen aufweisen. Wie der Einstellhilfe zu entnehmen ist, wird sie heute für alle Gerätetypen (AE4) von **on-** auf **off-Zustand** umprogrammiert.

Nr.	Funktion	Einstellwerte des SDA9361								siehe Text
			nach Eingabe von		Serienkonfiguration					
		EEPROM (neu)	TT49	TT76	All	25 inch	28 inch	29 inch	32 inch	
01	V Size	19	19	19	Adj.					K
02	V Centre	224	224	224	Adj.					K
03	V Linearity	250	250	250	Adj.					K
04	S Correction	171	171	171	Adj.					K
05	H Size	42	42	42	Adj.					K
06	Pin Amp	209	209	209	Adj.					K
07	Up Corner Pin	240	240	240	Adj.					K
08	Low Corner Pin	220	220	220	Adj.					K
09	V Bow	251	251	251	Adj.					K
10	Pin Phase	167	167	167	Adj.					K
11	V Angle	235	235	235	Adj.					K
12	HDE	on	on	on	on					S
13	VR	0	0	0	0					S
14	RABL	on	on	on	on					S
15	Blk Dis	off	off	off	off					S
16	2FH 2*Line Frq	on	on	on	on					S
17	Standby Mode	off	off	off	off					S
18	Vertical	on	on	on	on					S
19	BSE Blk select	off	off	off	off					S
20	SSE Start Scan	off	off	off	off					S
21	SRSE Start Red Scan	off	off	off	off					S
22	GBE Guard band	off	off	off	off					S
23	STE Scan time table	off	off	off	off					S
24	NSA Self Adaption	on	on	on	on					S

Nr.	Funktion	Einstellwerte des SDA9361								siehe Text
			nach Eingabe von		Serienkonfiguration					
		EEPROM (neu)	TT49	TT76	All	25 inch	28 inch	29 inch	32 inch	
25	V EHT comp	0	0	0		110	111	75	90	K/S
26	H EHT comp	0	0	0		100	85	35	90	K/S
27	H Centre	63	63	63	32					K/S
28	PWM start	0	0	0	0					S
29	D/A	0	0	0	0					S
30	V blk time	0	0	0		28	28	28	27	K/S
31	H blk time	0	0	0	37					K/S
32	Start V Scan	0	0	0	0					S
33	H blk phase	0	0	0	61					K/S
34	V Scan width 0	0	0	0	0					S
35	V Scan width 1	0	0	0	0					S
36	Guard Band	0	0	0	0					S
37	Start red. scan	0	0	0	0					S
38	Number fields	1	1	1	1					S
39	NI Non Interlace	off	off	off	off					S
40	NR Vsync Noise Red	on	on	on		off	on	off	on	K/S
41	SSC with VBL	on	on	on	on					S
42	Min lines/field	0	0	0	0					S
43	Max lines/field	0	0	0	0					S
44	AFC EHT comp	0	0	0	0					S
45	PLL Freq	6	6	6	6					S
46	VCR	on	on	on	on					S
47	Gen Mod	off	off	off	off					S
48	HSWID	on	on	on	on					S

Nr.	Funktion	Einstellwerte des SDA9361								siehe Text
		nach Eingabe von			Serienkonfiguration					
		EEPROM (neu)	TT49	TT76	All	25 inch	28 inch	29 inch	32 inch	
49	Int H phase	0	0	0		7	Adj.	7	Adj.	K/S
50	PWM width	0	0	0	0					S
51	Noisy VCR	off	off	off	off					S
52	Killzip	off	off	off	off					S
53	tc3rd	off	off	off	off					S
54	Bandgap4 off	off	off	off	off					S
55	Bandgap off	off	off	off	off					S
56	Bandgap	0	0	0	0					S

K = **K**orrektur / **S** = **S**ervice Mode
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT76** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **01-11, 25-27, 30-31, 33, 40** und **49** nach Serienkonfiguration erfolgen. Die Funktionen 01-11 sind abzugleichen, da es sich hier um Geometrieeinsteller handelt.

Alle mit einem **S** versehenen Funktionen werden im IC-Menü weiß dargestellt und sind nicht veränderbar (siehe **TT04/Testmode 2**). Um dennoch Korrekturen durchführen zu können, ist der Programmplatz **99** anzuwählen und danach der Befehl **TT05/Testmode 2** einzugeben. Nach erfolgter Korrektur den Service Mode über **Programmplatz 99** und **TT04** wiederherstellen.

Zu Funktion **49** (Int H phase): Siehe **Test Mode 2/TT31** bzw. siehe aktuelle Servicehilfe.

Nr.	Funktion	Einstellwerte des TDA9143							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT86	All	C3	WX2	WS4	
01	Source	2	2	2	0				K
02	Trap bypass	off	off	off	off				
03	Comb Filter	off	off	off	off				
04	Loop closed	on	on	on	on				
05	Time Const	0	0	0	0				
06	XTAL	3	3	3	3				
07	Field Frq	3	3	3	3				
08	OutPort A	off	off	off	off				
09	OutPort B	off	off	off	off				
10	Standard	0	0	0	0				
11	Forced RGB	off	off	off	off				
12	Enable FS	off	off	off	off				
13	External RGB clamp	off	off	off	off				
14	Hue	32	32	32	31				K
15	Line Lock HA mode	on	on	on	on				
16	Force wide window	off	off	off	off				
17	Pal+ Helper blank	0	0	0	0				
18	Baseband delay bypass	off	off	off	off				
19	Low Power Standby	off	off	off	off				
20	MacroVision gating	on	on	on		off	off	on	K
21	Lumi delay control	7	7	7	9				K

K = Korrektur
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT86** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **01, 14, 20** und **21** nach Serienkonfiguration erfolgen.

Nr.	Funktion	Einstellwerte des S87C654							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT81	All	C25/C29	28/32WX	28/32WS	
01	FRQ Acqui	1	1	1	1				
02	FRQ Displ	1	1	1	1				
03	Acq Field 60Hz	off	off	off	off				
04	Pic Pos	0	0	0	0				
05	Init ECO/Bend/Nor	off	off	off	off				
06	LFR	on	on	on	off				K
07	NR AABB	off	off	off	off				
08	AABB Cor	off	off	off	off				
09	Cor Phase	off	off	off	on				K
10	Cine	off	off	off	off				
11	Phase	off	off	off	off				
12	Auto Movie	off	off	off		off	on	on	K
13	Still	off	off	off	off				
14	V Zoom	off	off	off	off				
15	Zoom	0	0	0	0				
16	SDAF	off	off	off		off	*	**	K
17	Gen Mode	off	off	off	off				
18	Sat Mode	off	off	off	off				
19	Pip pos	0	0	0	0				
20	Pip Freeze	off	off	off	off				
21	3*4 Pip	off	off	off		off	on	on	K
22	Mlt Pip	off	off	off	off				
23	Pip 60Hz	off	off	off	off				
24	Noise Red	0	0	0		0	2	2	K

Nr.	Funktion	Einstellwerte des S87C654							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT81	All	C25/C29	28/32WX	28/32WS	
25	Split Screen	0	0	0	0				
26	Screen Fade	0	0	0	0				
27	Phase Adapt	off	off	off	off				
28	res	off	off	off	off				
29	HWE	0	0	0	9				K
30	HAMSBDEL 2	off	off	off	off				
31	HAMSBDEL 3	off	off	off	off				
32	Take HAMSBDEL	off	off	off	off				
33	HWE 2steps	off	off	off	off				
34	VWE up	off	off	off	off				
35	VWE1D0	0	0	0	0				
36	Blank_F0	off	off	off	off				
37	Blank_F1	off	off	off	off				
38	Blank_F2	off	off	off	off				
39	Blank_F3	off	off	off	off				
40	res	off	off	off	off				
41	res	off	off	off	off				
42	res	off	off	off	off				
43	res	off	off	off	off				
44	PalPlus	off	off	off	off				
45	Dis_Blank	off	off	off	off				
46	Half P14	off	off	off	off				
47	VGA P13	off	off	off	off				
48	VFreq P15	off	off	off	off				

Nr.	Funktion	Einstellwerte des S87C654							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT81	All	C25/C29	28/32WX	28/32WS	
49	VM P34	on	on	on	on				
50	Master P35	off	off	off	off				
51	VDFL_inc	off	off	off	off				
52	res P20	off	off	off	off				
53	PaP P21	off	off	off	off				
54	TaT P22	off	off	off	off				
55	Frame P23	off	off	off	off				
56	Format P24	off	off	off	off				
57	Pat P25	off	off	off	off				
58	SubStill P26	off	off	off	off				
59	H Lock P27	on	on	on	on				
60	Take R12	off	off	off	off				
61	R12 Hor Delays	0	0	0	0				
62	Take R13/14	off	off	off	off				
63	R13 HWE2STA	0	0	0	214				K
64	R14 HWE2STO	0	0	0	208				K
65	Take R15/16	off	off	off	off				
66	R15 VWE2STA	0	0	0	20				K
67	R16 VWE2STO	0	0	0	47				K
68	Take R17	off	off	off	on				K
69	R17 HDDEL	0	0	0	7				K
70	Take R18	off	off	off	off				
71	R18 HDMSB	0	0	0	225				K
72	Take R19	off	off	off	off				

Nr.	Funktion	Einstellwerte des S87C654							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT81	All	C25/C29	28/32WX	28/32WS	
73	R19 VDMSB	0	0	0	0				
74	Take Reg20/21	off	off	off	off				
75	R20 HDSTA	0	0	0	0				
76	R21 HDSTO	0	0	0	0				
77	Take Reg22	off	off	off	on				K
78	R22 HWE1 Main	0	0	0		50	Adj.	Adj.	K
79	R23 Taste	0	0	0	4				K
80	R24 Status	0	0	0	0				
81	R25 NE	0	0	0	200				K
82	R26 Noise Est	0	0	0	0				

K = Korrektur
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT81** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **06, 12, 16, 21, 24, 29, 63-64, 66-69, 71, 77-79**,und **81** nach Serienkonfiguration erfolgen.

Zu Funktion 16 (SDAF):

Gerätetyp	Land	
***WX2:**		
	A / B /U	=off
	D / E	=on
****WS4:**	B	=off
	OTHERS	=on

Zu Funktion 78 (R22 HWE1 Main): Siehe **Test Mode 2/TT32** bzw. **siehe aktuelle Servicehilfe.** 28/32WX- und 28/32WS-Geräte müssen im Test Mode 2 mit Hilfe von TT32 eingestellt werden. Den Einstellwert anschließend im IC-Menü überprüfen. Bei Pal Plus-Geräten darf er nicht auf 64 eingestellt sein. Wenn doch, dann als neue Einstellung 63 oder 65 vorgeben.

Nr.	Funktion	Einstellwerte des TDA9170					siehe Text
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT82	Serienkonfiguration All	
			siehe Text	siehe Text			
01	Sleep mode	on	on	on	on	on	
02	Amplitude selection	on	on	on	on	on	
03	Window selection	3	3	0	0	0	K
04	Black offset enable	on	on	on	on	on	
05	User variable gamma	63	63	32	32	32	K
06	Adaptive gamma	63	63	15	15	15	K
07	Non - linear ampl.	63	63	15	15	15	K
08	Line start	15	15	0	0	0	K
09	Line stop	15	15	0	0	0	K
10	Field start	15	15	0	0	0	K
11	Field stop	15	15	0	0	0	K

K = **K**orrektur
Nach einem **EEPROM-Austausch** muß eine Aktualisierung der grau gekennzeichneten Funktionen **03 und 05-11** nach Serienkonfiguration erfolgen. Der Abgleich kann vereinfacht werden, wenn der Befehl **TT82** genutzt wird. Wie der Tabelle zu entnehmen ist, gleicht der Befehl **TT82** auf die Einstellwerte eines Seriengerätes ab.

Der Befehl TT49 nimmt bei diesem IC eine Sonderstellung ein. Nach Eingabe von TT49 würden sich die Einstellwerte eines Seriengerätes nicht verändern. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 ebenfalls nicht verändert.

Nr.	Funktion	Einstellwerte des SDA9280							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT77	All	C3	WX2	WS4	
01	Int 444	on	on	on	on				
02	Int 422	on	on	on	on				
03	Incodc	on	on	on	on				
04	Incodl	off	off	off	off				
05	Infor	1	1	1	1				
06	Insneg	off	off	off	on				K
07	Trawid	4	4	4	11				K
08	Thresh	4	4	4	11				K
09	Vinv	off	off	off	off				
10	Uinv	off	off	off	off				
11	Cgrres	0	0	0	0				
12	Cgr	off	off	off	off				
13	Ydel1	6	6	6		8	9	9	K
14	Yinv	off	off	off	off				
15	Ygrres	0	0	0	0				
16	Ygr	off	off	off	off				
17	Bcof	8	8	8	4				K
18	Lcof	4	4	4	4				
19	Hcof	8	8	8	4				K
20	Phacom	0	0	0	2				K
21	Cor	off	off	off	on				K
22	Comex	off	off	off	off				
23	Comp	on	on	on	off				K
24	Readd	0	0	0	0				

Nr.	Funktion	Einstellwerte des SDA9280							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT77	All	C3	WX2	WS4	
25	Ovsamp	on	on	on	on				
26	Ovfilt	on	on	on	on				
27	Backgr	on	on	on	off				K
28	Hsdel	53	53	53	1				K
29	Bckpos	182	182	182	201				K
30	Bckwid	25	25	25	96				K
31	Black	16	16	16	71				K
32	Colby	0	0	0	1				K
33	Colfy	0	0	0	0				
34	Colbu	0	0	0	0				
35	Colfu	0	0	0	0				
36	Colbv	0	0	0	0				
37	Colfv	0	0	0	0				
38	Ydel2	off	off	off	off				
39	Ampv	on	on	on	on				
40	Ampu	on	on	on	on				
41	Ampy	on	on	on	on				
42	Pllon	off	off	off	on				K
43	Pllran	3	3	3	3				
44	Test11	0	0	0	0				
45	Test12	0	0	0	0				
46	Test13	0	0	0	0				
47	Divvco	4	4	4	4				
48	Divref	3	3	3	4				K

Nr.	Funktion	Einstellwerte des SDA9280							siehe Text
			nach Eingabe von		Serienkonfiguration				
		EEPROM (neu)	TT49	TT77	All	C3	WX2	WS4	

K = Korrektur
Nach einem **EEPROM-Austausch**, nach Eingabe von **TT77** oder nach Eingabe von **TT49** muß eine Aktualisierung der grau gekennzeichneten Funktionen **06-08, 13, 17, 19-21, 23, 27-32, 42** und **48** nach Serienkonfiguration erfolgen.

Zu Funktion 23 (Comp)
Diese Funktion kann zum Beispiel im Wide Mode aktiv geschaltet und von off- auf on-Zustand umgeschaltet werden. Ein zurücksetzen auf den alten Wert (off) wäre anschließend nicht mehr möglich. Wie man der Einstellhilfe entnehmen kann, ist dieser Schalter nach einem EEPROM-Austausch aber von on- auf off-Zustand zu korrigieren. In beiden Fällen kann eine Änderung **nur im 4:3 -Mode** erfolgen.

Zu Funktion 24 (Readd)
Wird diese Funktion im 4:3-Mode aktiv geschaltet, dann verändert sich der Einstellwert von 0 auf 45. Im **Wide Mode** kann diese Funktion dann wieder auf 0 zurückgesetzt werden (aktivieren-verändern-ok).

Zu Funktion 27 (Backgr)
Nach einem EEPROM-Austausch setzt sich dieses Parameter automatisch auf on-Zustand. **Nur** im **Wide Mode** kann diese Funktion von on- auf off-Zustand zurückgesetzt werden (aktivieren-verändern-ok).

Zu Funktion 32 (Colby)
Der nach einem EEPROM-Austausch vorherrschende Einstellwert 0 läßt sich **nur im 4:3-Mode** von 0 nach 1 hin korrigieren. Eingestellt werden die im 4:3-Mode links und rechts auftretenden schwarzen Balken. Der Einstellbereich erstreckt sich von 0 (dunkel) bis nach 15 (grau).

Zu Funktion 47/48 (Divvco/Divref)
Um nach einem EEPROM-Austausch bei der Funktion 48 (Divref) wieder den Einstellwert 4 zu erhalten, ist diese **einmal** im **Wide Mode** zu aktivieren und umzuschalten.

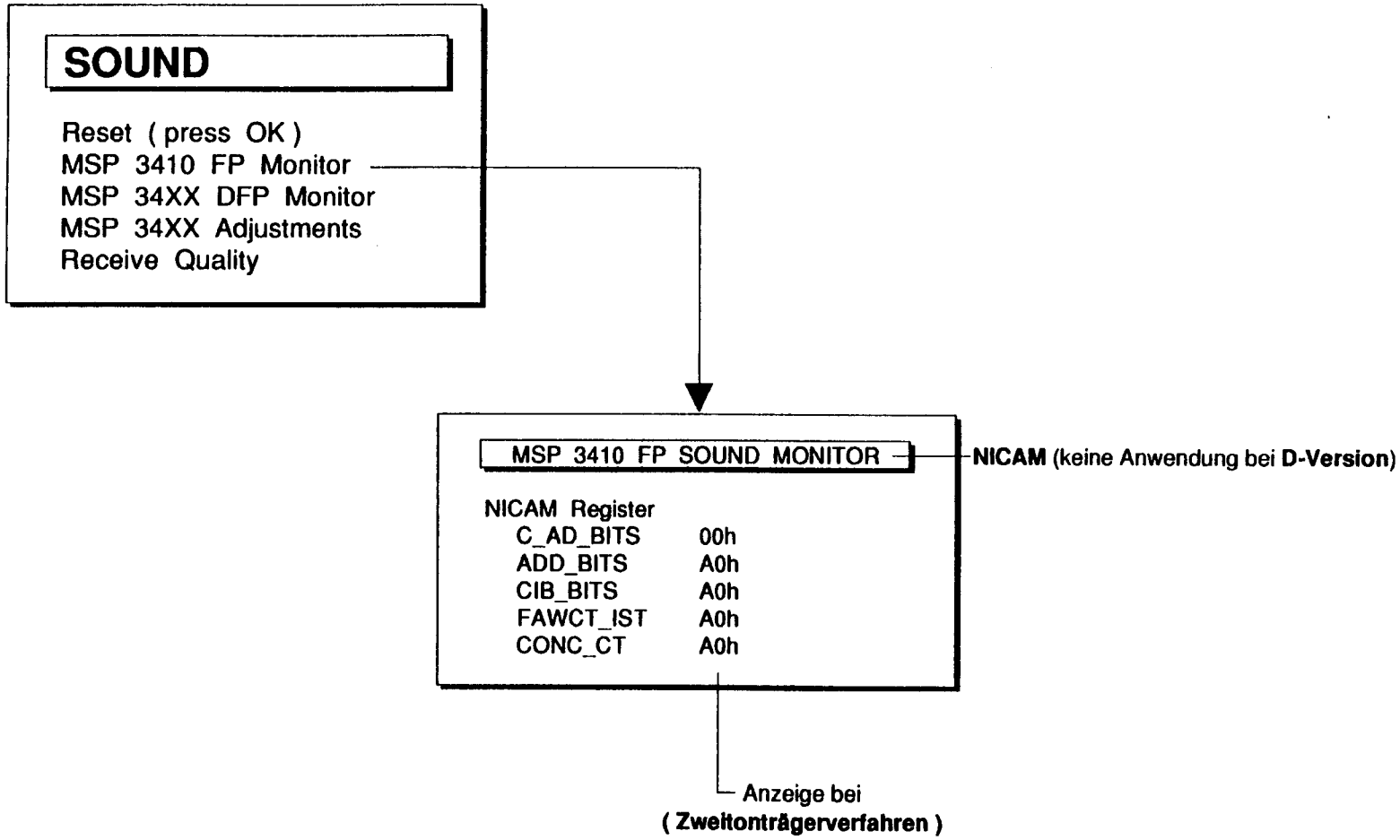
Nr.	Funktion	Einstellwerte des SDA9288					
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT87	Serienkonfiguration All	siehe Text
			siehe Text	siehe Text			
01	PIPON	on	on	off	on	off	K
02	FRAME	on	on	off	off	off	
03	LINEDBL	on	on	off	off	off	
04	READ27	on	on	off	on	off	K
05	PLLOFF	on	on	off	off	off	
06	FREEZE	on	on	off	off	off	
07	SYSACT	on	on	off	off	off	
08	MIXDIS	on	on	on	on	on	
09	SELDEL	15	15	1	1	1	
10	POSHOR 8-9	3	3	0	0	0	
11	POSHOR 0-7	255	255	12	192	12	K
12	POSVER	255	255	48	48	48	
13	YDEL	7	7	0	0	0	
14	SW1	3	3	0	0	0	
15	SW2	3	3	0	0	0	
16	IMOD	3	3	0	0	0	
17	PMOD	3	3	0	0	0	
18	CHRINS	on	on	on	on	on	
19	INSHVI	on	on	on	on	on	
20	DECHOR	on	on	off	off	off	
21	DECVER	on	on	off	off	off	
22	HSIDEL	15	15	5	4	5	K
23	CLISW	on	on	on	off	on	K
24	CLPFIX	on	on	off	off	off	
25	CLPS	on	on	off	off	off	

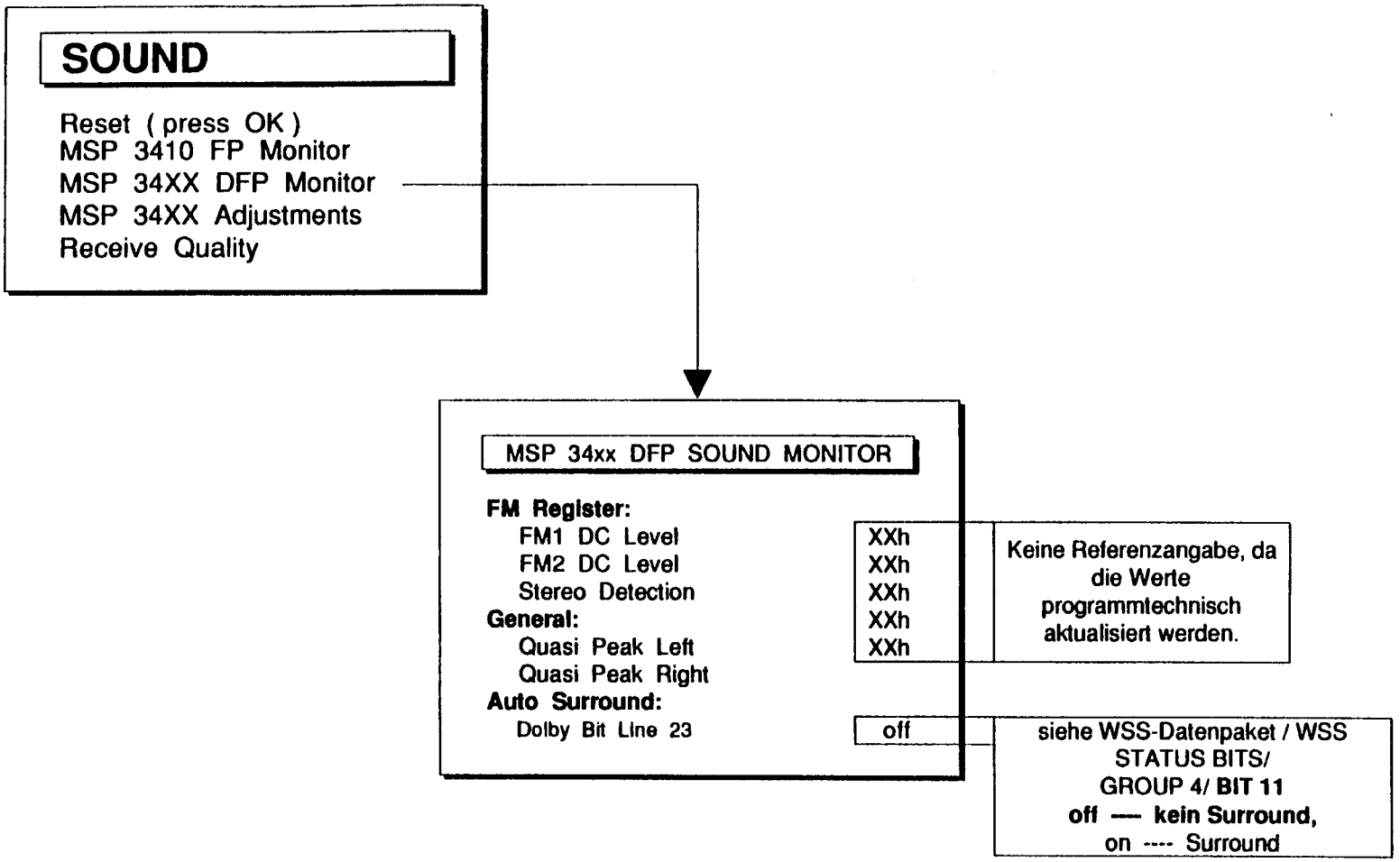
Nr.	Funktion	Einstellwerte des SDA9288					siehe Text
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT87	Serienkonfiguration All	
			siehe Text	siehe Text			
26	VSIDEL	31	31	0	0	0	
27	VSIISQ	on	on	off	off	off	
28	AMSEC	on	on	off	off	off	
29	VSPDEL	31	31	0	0	0	
30	VSPISQ	on	on	off	off	off	
31	PARSYND	on	on	on	on	on	
32	FRY	15	15	8	8	8	
33	CON	15	15	4	4	4	
34	FRU	15	15	0	0	0	
35	FRV	15	15	0	0	0	
36	FRWIDH	7	7	2	2	2	
37	FRWIDV	3	3	1	1	1	
38	OUTFOR	on	on	on	on	on	
39	CHRPIP	on	on	on	on	on	
40	MAT	7	7	4	4	4	
41	DACONDE	on	on	off	off	off	
42	PLLTC	3	3	3	1	3	K
43	DACONST	on	on	off	off	off	
44	LEFT POS	255	255	195	190	195	K
45	RIGHT POS LOW	255	255	0	11	0	K
46	RIGHT POS HIGH	3	3	2	2	2	
47	UPPER POS	255	255	58	55	58	K
48	LOWER POS	255	255	178	185	178	K

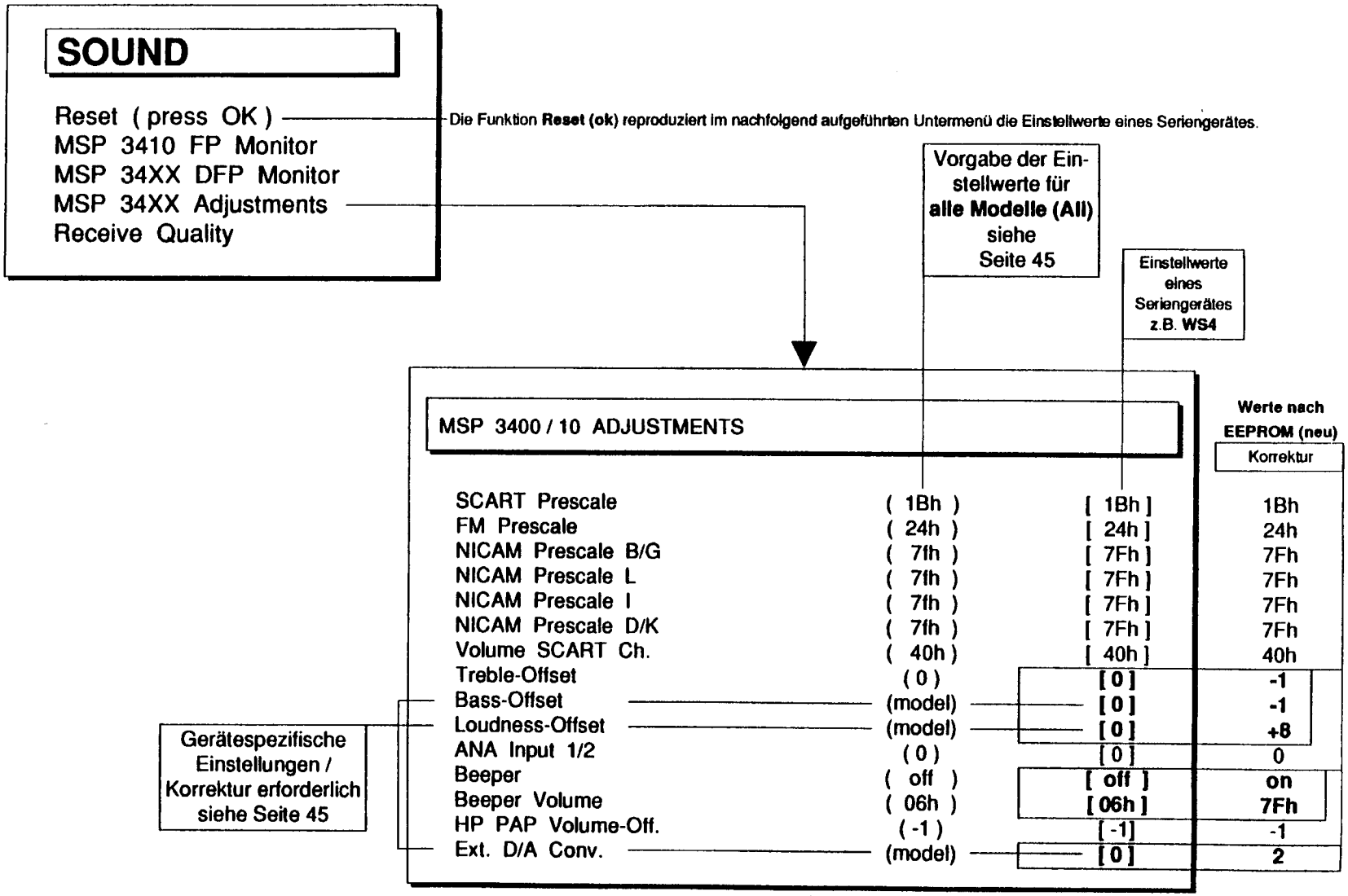
Nr.	Funktion	Einstellwerte des SDA9288					siehe Text
		EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT87	Serienkonfiguration All	
			siehe Text	siehe Text			

K = **K**orrektur
Nach einem **EEPROM-Austausch** muß eine Aktualisierung der Einstellwerte erfolgen. Der Abgleich kann vereinfacht werden, wenn der Befehl **TT87** genutzt wird. Anschließend sind in der Tabelle dann nur noch die grau gekennzeichneten Funktionen **01, 11, 22-23, 42, 44-45** und **47-48** nach Serienkonfiguration einzustellen.

Der Befehl TT49 nimmt bei diesem IC eine Sonderstellung ein. Nach Eingabe von TT49 würden sich die Einstellwerte eines Seriengerätes nicht verändern. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 ebenfalls nicht verändert.


SOUND
Reset (press OK)
MSP 3410 FP Monitor
MSP 34XX DFP Monitor
MSP 34XX Adjustments
Receive Quality
MSP 3410 FP SOUND MONITOR
NICAM Register
C_AD_BITS 00h
ADD_BITS A0h
CIB_BITS A0h
FAWCT_IST A0h
CONC_CT A0h
NICAM (keine Anwendung bei D-Version)
Anzeige bei
(Zweitonträgerverfahren)


SOUND
Reset (press OK)
MSP 3410 FP Monitor
MSP 34XX DFP Monitor
MSP 34XX Adjustments
Receive Quality
MSP 34xx DFP SOUND MONITOR
FM Register:
FM1 DC Level
FM2 DC Level
Stereo Detection
General:
Quasi Peak Left
Quasi Peak Right
Auto Surround:
Dolby Bit Line 23
XXh
XXh
XXh
XXh
XXh
off
Keine Referenzangabe, da die Werte programmtechnisch aktualisiert werden.
siehe WSS-Datenpaket / WSS STATUS BITS/ GROUP 4/ BIT 11
off --- kein Surround,
on ---- Surround


SOUND
Reset (press OK)
MSP 3410 FP Monitor
MSP 34XX DFP Monitor
MSP 34XX Adjustments
Receive Quality
Die Funktion Reset (ok) reproduziert im nachfolgend aufgeführten Untermenü die Einstellwerte eines Seriengerätes.
Vorgabe der Einstellwerte für alle Modelle (All) siehe Seite 45
Einstellwerte eines Seriengerätes z.B. WS4
MSP 3400 / 10 ADJUSTMENTS
Werte nach EEPROM (neu)
Korrektur
SCART Prescale (1Bh) [1Bh] 1Bh
FM Prescale (24h) [24h] 24h
NICAM Prescale B/G (7fh) [7Fh] 7Fh
NICAM Prescale L (7fh) [7Fh] 7Fh
NICAM Prescale I (7fh) [7Fh] 7Fh
NICAM Prescale D/K (7fh) [7Fh] 7Fh
Volume SCART Ch. (40h) [40h] 40h
Treble-Offset (0) [0] -1
Bass-Offset (model) [0] -1
Loudness-Offset (model) [0] +8
ANA Input 1/2 (0) [0] 0
Beeper (off) [off] on
Beeper Volume (06h) [06h] 7Fh
HP PAP Volume-Off. (-1) [-1] -1
Ext. D/A Conv. (model) [0] 2
Gerätespezifische Einstellungen / Korrektur erforderlich siehe Seite 45

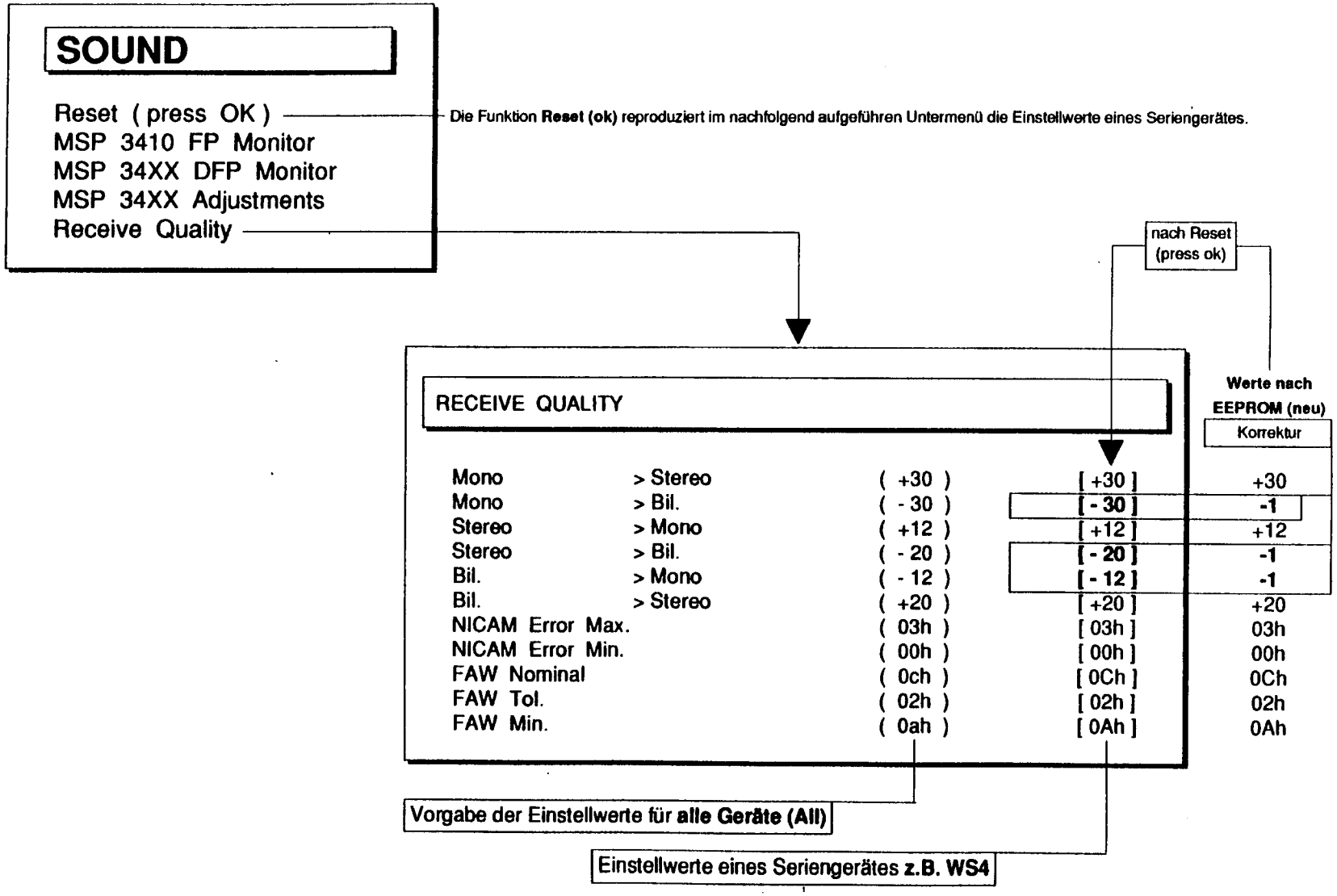
zu MSP 3400 / 10 ADJUSTMENTS

Funktion	EEPROM (neu)	nach Reset (press ok)	Serie	
SCART Prescale	1Bh	1Bh	1Bh	
FM Prescale	24h	24h	24h	
NICAM Prescale B/G	7Fh	7Fh	7Fh	
NICAM Prescale L	7Fh	7Fh	7Fh	
NICAM Prescale I	7Fh	7Fh	7Fh	
NICAM Prescale L	7Fh	7Fh	7Fh	
NICAM Prescale I	7Fh	7Fh	7Fh	
Treble-Offset	-1	0	0	
Bass-Offset	-1	0	(model) 0	K / siehe Seite 45
Loudness-Offset	+8	+8	(model) 0	K / siehe Seite 45
ANA Input 1/2	0	0	0	
Beeper	on	off	off	
Beeper Volume	7Fh	06h	06h	
HP PAP Volume-Off.	-1	-1	-1	
Ext. D/A Conv.	2	2	* (model) 0	K / siehe Text

Alle gerätespezifischen Einstellungen **(model)** müssen nach Eingabe von Reset (press ok) anhand der Einstellhilfe korrigiert werden.

zu ANA Input 1/2:
Diese Einstellmöglichkeit wird in der Fertigung nur für Testzwecke eingesetzt. Änderungen werden nicht im NVM gespeichert. Nach TT00 oder Power OFF/ON ist die automatische Abfrage wieder zugeschaltet.
0 = Automatisch (Norm I & D/K = Analogeingang 1, Norm B/G & L = Analogeingang 2)
1 = Analogeingang 1, 2 = Analogeingang 2

zu Ext. D/A Conv.
*** Adr_Enable_EXT_D/A:** 0 = ext. D/A OFF (WS-Model ohne NICAM), 1 = ext. D/A ON (WS-Model mit NICAM), 2 = auto det. ext. D/A (depend on NICAM MSP).


SOUND
Reset (press OK)
MSP 3410 FP Monitor
MSP 34XX DFP Monitor
MSP 34XX Adjustments
Receive Quality
Die Funktion Reset (ok) reproduziert im nachfolgend aufgeführen Untermenü die Einstellwerte eines Seriengerätes.
nach Reset (press ok)
RECEIVE QUALITY
Werte nach EEPROM (neu)
Korrektur
Mono > Stereo (+30) [+30] +30
Mono > Bil. (- 30) [- 30] -1
Stereo > Mono (+12) [+12] +12
Stereo > Bil. (- 20) [- 20] -1
Bil. > Mono (- 12) [- 12] -1
Bil. > Stereo (+20) [+20] +20
NICAM Error Max. (03h) [03h] 03h
NICAM Error Min. (00h) [00h] 00h
FAW Nominal (0ch) [0Ch] 0Ch
FAW Tol. (02h) [02h] 02h
FAW Min. (0ah) [0Ah] 0Ah
Vorgabe der Einstellwerte für alle Geräte (All)
Einstellwerte eines Seriengerätes z.B. WS4

MSP 3400/10 ADJUSTMENT	**All**
Scart Pr	1Bh
FM PRESC	24h
N-P B/G	7Fh
N-P L	7Fh
N-P I	7Fh
N-P D/K	7Fh
Volume Scart Channel	40h
Treble	0
Bass	0
Beeper ON/OFF	off
Beeper-Volume	06h

MSP 3400/10 ADJUSTMENT	**All**	**C3**	**WX2**	**WS4**
Volume Level Speaker	22			
Volume Level Headphone	22			
Balance	00			
Pap Headphone Volume Offset	-1			
Treble Offset	0			
Bass Offset		2	2	0
Sound effects	00			
Offset L	00			
Offset C	00			
Offset R	00			
Offset S	00			
Loudness Offset		9	5	0
Adr_Enable_EXT_DA		0	0	* (siehe Seite 42)
Sound Control	00			
Dolby Setup	03			
Sounddelay Setup	03			
Intelligent Sound Mode	00			

	PALPLUS	Monitor	
		Bin	Hex
	Helper Gain	0	
	Helper Offset	0	
	Y Black	0	
	Y White	0	
	Noise	0	
	L.-.F.S.N.-.1.0	00011010	1A
	S.u.H.C.F.F.m.t	00000000	00

Nr.	Funktion	EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT78	Serienkonfiguration All	siehe Text
			siehe Text	siehe Text			
01	Modes setting	11111111	11111111	00000000	00000000	00000000	
02	Help. G. Control	63	63	42	42	42	
03	Help. O. Control	-1	-1	-7	-13	-7	K
04	TDA 9144 HUE	32	32	32	32	31	G
05	Luma G. Control	0	0	0	0	0	G
06	Luma O. Control	-1	-1	-31	-32	-31	K
07	Adapt. Notch V	15	15	7	15	7	K
08	Adapt. Notch U	15	15	7	15	7	K
09	100 Hz	2	2	0	0	0	G

Nr.	Funktion	EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT78	Serienkonfiguration All	siehe Text
			siehe Text	siehe Text			
10	Auto / Man	**00000000**	**00000000**	00000000	00000000	00000000	**G**
11	VTR H/C+ on	**255**	**255**	75	75	75	
12	VTR H/C+ off	**255**	**255**	85	85	85	
13	TDA 9144P+HeBl	**off**	**off**	off	off	off	**G**
14	TDA 9144LuHeDy	**off**	**off**	off	off	on	**G**
15	TDA 9144BaDyLi	**off**	**off**	off	off	off	**G**
16	TDA 9144LuDeCo	**on**	**on**	on	on	on	**G**
17	ZoomPosPTCstar	**03FFh**	**03FFh**	000Ch	0000h	000Ch	**K**
18	ZoomPosECOstar	**03FFh**	**03FFh**	0000h	0000h	0000h	
19	ZoomPos invert	**on**	**on**	off	off	off	
20	PALencoderCphs	**on**	**on**	on	on	on	
21	PALencoderCsel	**on**	**on**	on	on	on	
22	PALencoderCinv	**on**	**on**	on	on	on	
23	MasterClkMCphs	**3**	**3**	0	0	0	
24	MasterClkMCsel	**on**	**on**	on	on	on	
25	Hout Delay	**3**	**3**	0	0	0	
26	Hhigh	**03FFh**	**03FFh**	02CEh	02CEh	02CEh	
27	Hlow	**03FFh**	**03FFh**	0007h	0007h	0007h	
28	PLL Set	**07FFh**	**07FFh**	06BFh	06BFh	06BFh	

K = **K**orrektur/**G** = **G**esperrt

Erklärender Text zum Abgleich (Line23 det) siehe Seite 48

Nr.	Funktion	EEPROM (neu)	EEPROM (neu) plus TT49	Serie plus TT49	nach Eingabe von TT78	Serienkonfiguration All	siehe Text
			siehe Text	siehe Text			

Nach einem **EEPROM-Austausch** muß eine Aktualisierung der Einstellwerte im **Menü Line23 det** erfolgen. Der Abgleich läßt sich vereinfachen, wenn der Befehl **TT78** genutzt wird. Anschließend sind dann nur noch die in der Tabelle **grau** oder durch ein **K** gekennzeichneten Funktionen **03, 06-08** und **17** nach Serienkonfiguration zu korrigieren.

Die zusätzlich noch durch ein **G** gekennzeichneten Funktionen **04-05, 09, 10** und **13-16** finden zur Zeit keine Anwendung und sind generell gesperrt. Deshalb brauchen mit **G** versehene Einstellungen im Abgleich nicht mehr berücksichtigt bzw. grau gekennzeichnet werden, obwohl EEPROM- und Seriendaten unterschiedlich sind.

Der Befehl TT49 nimmt bei diesem IC eine Sonderstellung ein. Nach Eingabe von TT49 würden sich die Einstellwerte der Funktionen 04 und 14 eines Seriengerätes verändern. Einstellwerte die sich nach einem EEPROM-Austausch einstellen, werden durch Eingabe von TT49 nicht verändert.